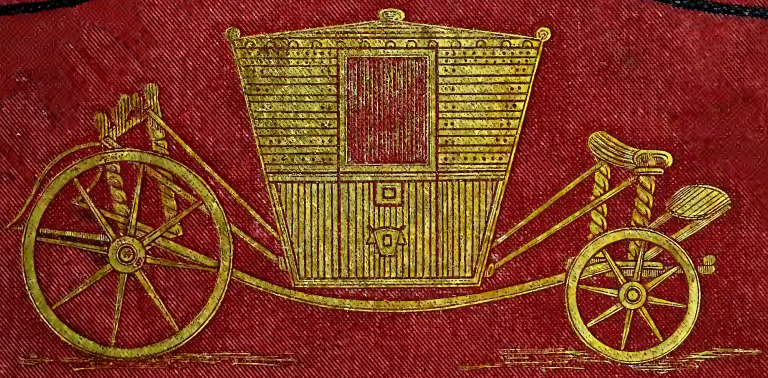


COACH OF THE TIME OF CHARLES II.

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ARTICLE VIII.—No member or holder of second class stock, whose annual contribution for the current year shall be unpaid or who is in arrears for fines, shall be entitled to the privileges of the Library or Reading Room.

ARTICLE IX.—If any member or holder of second class stock, shall refuse or neglect to comply with the foregoing rules, it shall be the duty of the Secretary to report him to the Committee on the Library.

ARTICLE X.—Any Member or holder of second class stock, detected in mutilating the newspapers, pamphlets or books belonging to the Institute shall be deprived of his right of membership, and the name of the offender shall be made public.

THE

HISTORY OF COACHES.


K&E

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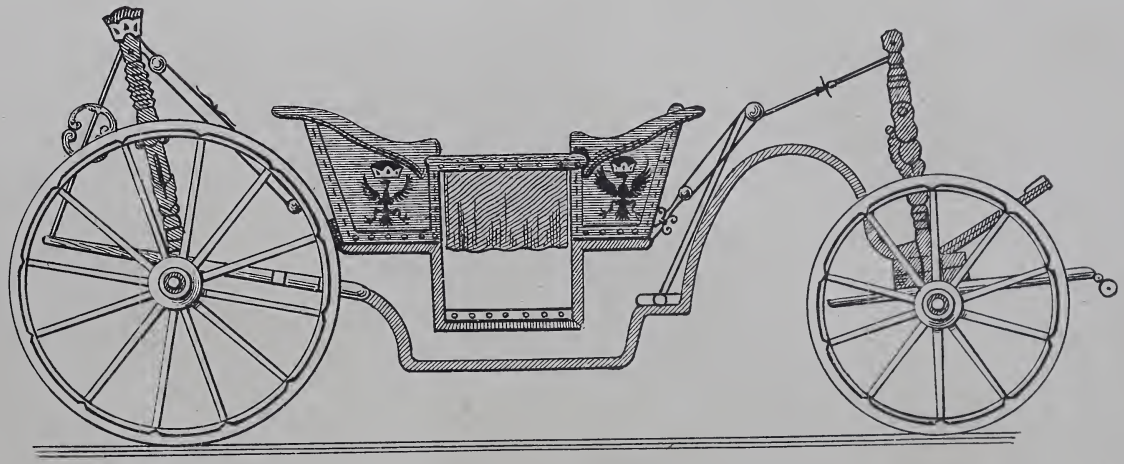


PLATE 37. PROBABLY THE FIRST SOCIABLE, THE PROPERTY OF THE EMPEROR OF GERMANY
A CHILD'S CARRIAGE OF THE DATE OF 1700.

FRANKLIN INSTITUTE LIBRARY

THE

HISTORY OF COACHES

BY

G. A. THRUPP.

"O, then, I see Queen Mab has been with you,
Drawn with a team of little atomies,
Her Waggon spokes made of long spinners' legs;
Her Chariot is an empty hazel-nut,
Made by the joiner squirrel, or old grub,
Time out o' mind the Fairies' Coachmakers."

Romeo and Juliet, Act I. Scene 4

WITH NUMEROUS ILLUSTRATIONS.

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PREFACE.

"Chi va piano, va sano."*
Italian Proverb.

In the spring of 1876 I was requested by the Society for the Encouragement of Arts, Manufactures and Commerce to prepare a series of Lectures upon Coachbuilding.

I chose as my subject the History of that Art, as likely to be more interesting than a merely technical description of the method of constructing vehicles.

I was desirous of enlisting the sympathies of the Public in general in an Art so important to the requirements of the age, as well as of calling the attention of the artisans of our trade to the principles which govern the construction of Carriages.

I need hardly add that I received from the Society of Arts all the assistance in its power towards composing the substance of the Lectures, and also in the preparation of the numerous diagrams by which they were illustrated; they further aided in procuring a very large attendance of artisans, employers,

* Who goes softly, goes safely.

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and others interested in Coachbuilding, at the time of my delivering the lectures in November and December last, in their great room at John Street, Adelphi.

It is deemed desirable that these Lectures should be re-issued in their present form.

I found it very difficult to arrive at the shape of the vehicles used by our forefathers on account of the absence of any connected history, and also from the very vague descriptions contained in books on the subject, but which were not always written for technical purposes.

It was not therefore without considerable search in books and examination of paintings and old engravings, that I could at all ascertain the shapes of the earlier Coaches, and of course both my time and opportunities were limited to a few months.

I have little doubt that there remain rich mines of information unsearched by me, because unknown. I shall, however, be glad to receive any information that will enlarge our present knowledge.

There may be yet in England, or abroad, some ancient Carriages which deserve to be described and photographed before they perish; for Carriages are too bulky to be preserved in any quantity in national museums.

Scarce books and prints, too, may exist in many libraries, and a list might be made of them; and

a record is desirable also of those students of the Art of Coachbuilding who made their mark in the world and have passed away.

Any communication will be thankfully received and kept in an accessible place, to assist any future writer who may have the time to prepare a more complete record than I of the History of Coachbuilding.

G. A. THRUPP.

269 Oxford Street,
April, 1877.

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The History of the Art of Coachbuilding.

CHAPTER I.

Early Vehicles—Sledges — Solid Wheels — Egyptian Chariots—Early Vehicles Always had Two Horses — King Solomon's Wedding Chariot—An Egyptian Mummy Wheel—Grecian Chariots—Vehicles of Ancient Rome—Scythian and Persian Cars—Funeral Car of Alexander the Great—War Chariot of Ancient Britain—Roman Military Roads—Wheels Found at Pompeii—Later Vehicles of the Roman Empire—Ancient Roman Dray—Carriages of Hindostan—A Carriage of Ancient Hungary—Turkish Carriages—Welsh and Irish Cars—Bristol Coburg.

THE progress of the art of Coachbuilding, like the progress of most inventions and discoveries, has been slow. In certain ages it has seemed to make a sudden start, then again to remain almost stationary for a long time.

It is only during the last two centuries that coach-making has been in a satisfactory condition as an art, and it has arrived at comparative perfection only during the present century. The same, however, may be said of other inventions:—Pendulum clocks were invented about 1260; paper was made from old rags about 1250; gunpowder dates from the year 1330; printing, that valuable aid to the arts, 1430; watches are said to have been first made in England about the year 1500; and the first coach was seen in England in the year 1555, three hundred and twenty years ago.

The history of coaches and carriages is not as extensive as the human race, nor can it be traced among all those nations that have arrived at an advanced stage of civilisation. Ancient America, especially the civilised Mexico, tells us nothing; from China and Japan we gain next to nothing; and only a strip of North Africa contributes to the history of wheels. Europe, Asia Minor, Hindostan, and Tartary furnish nearly all the information we can glean.

The history of the art of Coachmaking must be divided into several marked epochs. The first terminates with the change of government at Rome from the rule by Consuls to the rule by Emperors, about 2000 years ago. Up to this time there had been little variation in the vehicles chiefly used. The second epoch terminates with the overturning of the Roman empire, about 1500 years ago; during that epoch, which was one marked by the display of great wealth, and the indulgence of most luxurious living, several new and larger vehicles were introduced, and many were decorated in a costly manner.

The third epoch commences with the introduction of vehicles slung upon leather straps, and may be considered to end about the year 1700, when the use of steel springs began to be understood.

The fourth epoch will end in 1790, when coaches began to assume their present form, size, and style.

And the last epoch must commence with the introduction of carriages hung wholly on elliptic springs, about 1805, by Mr Obadiah Elliott. This last and surprising change has been productive of very impor-

tant results to all interested in the use of carriages or in Coachbuilding.

By the introduction of elliptic springs the construction of wheeled vehicles has been rendered less costly, their weight has been materially reduced, and many complicated parts have been abandoned. Simultaneously the number of vehicles has been multiplied, and their comfort and accommodation have been increased.

We may fairly suppose the first means of locomotion entitled to the name of a carriage to have been a sledge. It would be so natural to place a burden, too heavy for the shoulders, on some slight framework, and drag it over the ground. A very little experience would enable a man to judge of the best form for a sledge; and, in point of fact, the first sledge of which we find any record, on a sculpture of the Temple of Luxor, at Thebes, in Egypt, is precisely similar to that used by brewers' draymen in London. It has two long runners slightly turned upwards in front, and half-a-dozen cross pieces to unite the runners and bear the burden.

Sledges of many shapes and fashions are in use during the winter in most countries where snow lies for any length of time upon the ground, as sledges glide more easily over its surface than do wheels. The Esquimaux and the Laplanders habitually use sledges, all more raised from the ground than the sledge that carries the casks of the brewers. The Swiss and other inhabitants of mountain districts use sledges to bring down hewn timber and faggots to the valleys; and a hundred years ago, when carts were not so numerous,

it was common in England to load the new-made hay or sheaves of wheat on light high sledges for transport to the farm yard. In North America and Northern Europe, sledges of elegant shape are every year in use; and in Holland and Belgium, during some winters, not only do the gentry ride in sledges two or three months, but the meat, bread, and vegetables are run through the streets daily on hand sledges.

Egypt is the chief of the countries of which we have any record of the arts and manufactures introduced by the progress of civilisation. Egypt had, at an early period, buildings composed of very large stones; in moving these the sledge and the roller were used; and it is natural that these should be combined to form a low truck or platform moving on rollers. Later on, wheels and axles were substituted for rollers; at first wheels were slices of the trunk of a tree, all solid pieces of wood, and firmly wedged to the axles. Thus the wheels and axle revolved together below the cart or truck, and were retained in their position by strong wooden pins like the thole-pins or rowlocks of a boat. The wheels and axle revolve together in tramway cars and in railway carriages. Carts are made in this way now in Portugal, Spain, and in South America. All the earlier carts seem to have been fitted only with a pole, and at least two animals seem always to have been yoked together to the vehicle. The objection to the wheels and axle in one piece is, that it is difficult to turn a vehicle thus fitted in a small space. Any one using a garden-roller round a corner may easily convince himself of this, for whilst the outer edge of

the roller is going over the necessary sweep, the inner edge is sliding on and crushing the gravel walk; it should be moving independently. It was soon discovered in Egypt that it was better to have a fixed axle-tree, and allow the wheels to revolve independently of one another.

A wheeled carriage appears to have been in very general use in Egypt at an early period, called a car or chariot: in the Bible it is usually translated "chariot." There are paintings and sculptures upon the walls of the temples and tombs of Egypt which have lasted four thousand years, and from those we learn precisely the appearance of these chariots. They are of great interest to us, as they formed the chief means of conveying man for two thousand years before Christ, and were more or less the type of all other vehicles of the ancient world.

We find certain words used in describing them, both by Homer, who lived a thousand years before Christ, and by Moses, who lived at least five hundred years earlier, and that the words are technical terms, such as axles, wheels, naves, felloes, tyres, spokes, &c. Now technical terms imply that the art that had such terms must have existed prior to the writer who speaks of the art, so that, if we hesitated as to the date of the chariots sculptured and painted on the walls of the Egyptian temples, we are reassured by the terms used by the authors we name. Moses, in the description of the wheels upon which moved the great cauldron used by the priest, and Homer, in describing the car of the goddess Juno, used the same terms. We read in the

fifth book of the Iliad, "The awful Juno led out the golden-bitted horses, whilst Hebe fitted the whirling wheels on the iron axles of the swift chariot. The wheels had each eight brazen spokes, the felloes were of gold secured with brazen tyres all round, admirable to the sight. The seat was of gold, hung by silver cords; the beam (or pole) was of silver, at the end of which was hung the golden yoke and the golden reins."

These cars [Plate 1, Figure 1] were occasionally square, but more generally semicircular or horse-shoe shaped; the rounded front towards the horses was high, the sides lower, the back was open, and the bottom was near the ground, so that it was easy to step in and out. The wheels, especially in Egypt, were very low, from 2 ft. 6 in. to 3 ft. 3 in. in height. The framework of the body was often open, but sometimes closed up with leather skins or basket-work, and occasionally with carved wood or embossed metal. The pole by which it was supported curved up from the bottom of the bar to the backs of the necks of the horses or oxen, where it was joined to a wooden yoke, this was again strapped round the bodies and necks of the horses, or tied to the horns of the oxen. The addition of bridles and reins would complete the simple harness. Some horses were attached to the pole by an iron bar with knobs at each end, which passed through a ring at the end of the pole, and through a similar ring upon each of the pads or saddles of the horses. This would be very similar to the curricle bars used in modern times, and would allow of more

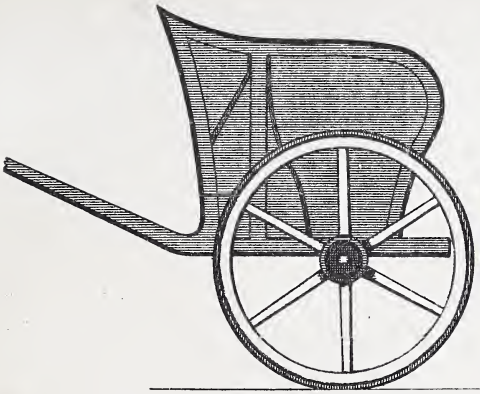


FIG: 1 EGYPTIAN CAR,

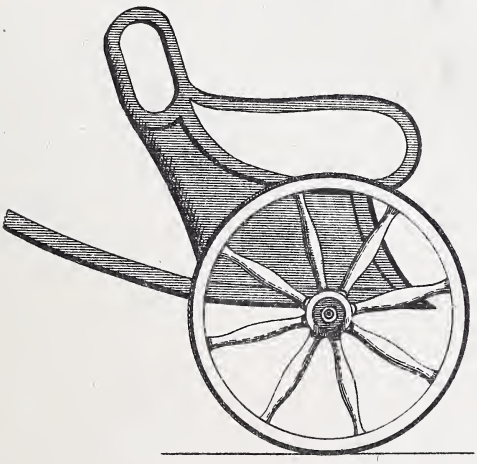


FIG: 2. GRECIAN, CAR,

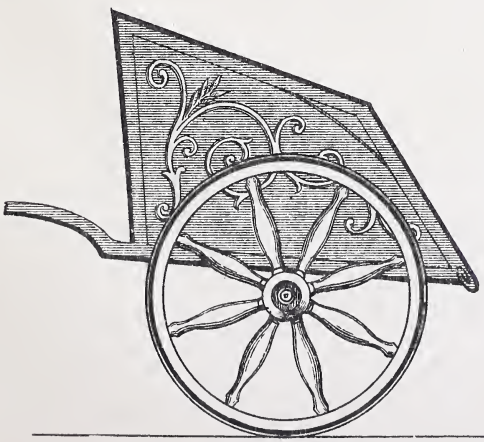


FIG: 3. ROMAN CAR

freedom in motion than a fixed yoke would give. The bodies of these chariots, in Egypt at least, were small, usually containing but two persons standing upright. It may be remarked that, as they were so small, they could not have been of much use, and from the small size of the wheels, too, they would be jolted by every little obstacle on the road; and as they were so near the ground, those using them would be exposed to mud and dirt: yet, in spite of these objections, they were used in vast numbers. They were very light, and could be driven at a great speed—nearly as fast as the horses could gallop. They were narrow, and, therefore, suitable to cities in which the streets are still very narrow, and to mountain roads which were often only 4 ft. wide. They suited the period and the people, or their usefulness would not have lasted 2000 years. According to Homer, a strong man could lift a chariot on his shoulders and carry it away. Possibly this would be without the wheels, but even then it could not have been heavier than one of our wheel-barrows.

From Egypt the use of chariots spread into other countries, and they were used in war in large numbers upon the extensive plains of Asia. We read of the 900 chariots of Jabin, king of Canaan; that David took 700 chariots from the kings of Syria, and 1000 from the king of Zobah. Solomon had 1400 chariots, and his merchants supplied northern Syria and the surrounding countries with chariots fetched up out of Egypt at 600 shekels (about £50) a-piece. They were not the first nor the last merchants who have preferred their pockets to their patriotism, and supplied

nations who might become their country's enemies with the weapons of warfare. Solomon, we find, in the Song of Solomon, built a state or wedding chariot of cedar with pillars of gold, probably supporting a canopy. We may also notice the poetic description by the prophet Nahum of the future state of Nineveh, no longer to echo "to the noise of the chariots raging up and down the paved streets, jostling against one another in the broad ways, with the crack of the whip, the rattle of the wheels, the prancing horses and the jumping chariots;" and the remark in another place of "the stamping of strong horses, the rushing of the chariots, and the rumbling of the wheels," all pointing to the great impression which was made upon the prophet of the wilderness by the carriages and noise of the crowded city.

In a museum of New York is a wheel of an Egyptian chariot, found in a mummy pit at Dashour, by Dr Henry Abbott. It is 3 ft. 3 in. high, the nave is 14½ in. long, and 5 in. in diameter, and worked upon an axle of wood which tapered, and was from 3 in. to 2¾ in. in diameter. The unusual size and length of this axle-arm would be very apparent in so small a vehicle as the Egyptian chariot; the spokes, six in number, are 2 in. by 1⅜ in. at the nave, and taper towards the felloe to 1⅜ in. round; it has a double rim all round. The six inner felloes do not meet as in modern wheels, but are spliced one over the other, with an overlap of 3 in.; the felloes are 1½ in. square. The outer rim is formed also of six felloes, but they are tenoned together, and are pierced all round the lower edge with small holes,

through which, we may well conjecture, leather thongs passed, binding the outer to the inner rim. The total depth of the double rim is $3\frac{1}{4}$ in. by $1\frac{1}{4}$ in. to $1\frac{1}{2}$ in. in width.

From the ancient sculptures preserved from Nineveh and Babylon, some of which are in the British Museum, we observe the use of chariots was continued in the great plains, for the purposes of hunting as well as for war. The chariots of Assyria were larger than those of Egypt, and would carry three or more persons; they seem, too, much heavier in the build.

The Greeks used chariots, and at the siege of Troy, which Homer has immortalised in his poem, all the chief warriors on both sides are described as going into battle and fighting from their chariots. As years passed on, however, the Greeks no longer used chariots for war, but only for processions in public on state occasions, or in their great races, or for the amusement of their leisure hours. Erectheus, king of Athens, is reported to have been the first to drive four horses in a car; afterwards it became common to use, in the races, four horses attached to each car. The Grecian chariots were all curved in front, and were rather larger and on higher wheels than those used in Egypt. [Plate 1, Figure 2.]

The Roman nation, as it increased in power, adopted the car, which had also been for many years in use by the Etrurians, a neighbouring country to their own in the Italian peninsula. The Etrurians were traditionally the first to place a hood or awning over the open two-wheeled car; they

decorated both the car and the awning with that beautiful tracery and ornamental bordering which is familiar to us from the copies of their pottery. The Roman car was chiefly used in the cities, and for purposes of show and state rather than for daily use. A beautiful marble model of one of these still exists at the Vatican in Rome; a copy of it and the horses drawing it is in the Museum at South Kensington. [Plate 1, Figure 3.]

Besides the chariots the Romans had other two-wheeled cars, and four-wheeled waggons of different shapes, and giving different accommodation; but first they were kept for conveying agricultural produce, and for moving goods and baggage, and the better sorts were reserved for the conveyance of the images of their gods and vestal virgins in religious processions. Then came the triumphal processions of successful military commanders, and a variety of vehicles conveyed the conqueror, the captives, and the arms and valuables taken from the enemy. Plutarch tells us that Emilius, the Roman Consul, had 750 waggons in his triumph in the year 170 B.C., bearing the spoils of Perseus, last king of Macedonia. On the column of Trajan at Rome is modelled one of these waggons. It is a large square basket on four wheels, the back a little higher, and the hind wheels also are a very little higher than the front.

Roman history, of the time of Camillus, 350 B.C., mentions a carriage termed a *Pilentum*, as a splendid four-wheeled carriage with a covering to it, and with seats suspended by straps. The use of these *Pilenta*

was allowed as a special favour to a few great Roman ladies. The Empress Agrippina also had a *Carpentum*, an elegantly carved carriage on two wheels, the arched covering of which was supported by four female statues; it was drawn by two mules. The Romans also used *Basternæ*, which were litters or couches with low coverings, carried on poles by horses or mules; and *Lecticæ*, or litters carried by men only. The Roman chariot was called a *Currus*.

Herodotus (450 B.C.), and other writers tell us of the vehicles of the ancient Scythians. These were a race of people who inhabited the country near the Caspian Sea, and wandered about with large herds of cattle and horses. They used a rough two-wheeled cart which consisted of a platform, on which they placed a covering shaped like a bee-hive, and composed of basket-work of hazel-wood covered with skins of beasts or thatched with reeds. When they were stationary in any part these bee-hive huts were taken off the carts, and placed upon the ground to serve as their dwellings, like gipsy tents.

The war-chariots used by the Persians were larger and more unwieldy than those previously built. The idea seems to have been to form a sort of turret upon the car, from which several warriors might shoot or throw their spears. These chariots were provided with curved blades or scythes projecting from the axle-trees. The Persians had also cars that were used for state processions, in which the king or noble was raised above the crowd among which he passed on a sort of throne of many steps.

The Dacians, who inhabited Wallachia on the Danube and part of Hungary, were conquered by the Romans about the year 300. Their cars are sculptured upon Roman monuments, and resemble the Persian cars. They are on two wheels and drawn by two horses; the shape is that of a large square box or chest, with a smaller box upon it, which formed a seat for the passengers. The spokes of the wheels are six in number, and are widest at the ends supporting the rims of the wheels. A Dacian car of this sort is represented upon a fragment of terra cotta in the British Museum.

Alexander the Great, King of Macedon, invaded Asia and advanced to India; he was met upon the banks of the river Indus by King Porus, in whose army were a number of elephants of large size, and also several thousand chariots; each chariot carried six persons; but the historian notes that in a soft soil or in rainy weather it was difficult for these vehicles to move quickly. On Alexander's return from India towards Persia, he travelled in a chariot drawn by eight horses, on which a square stage or platform was erected and covered in by a tent. His car was followed by an innumerable number of others, covered with rich carpets and purple coverlets; some shaped like shells or cradles were shaded with the branches of trees. I have seen a drawing of a Persian car in which the body is raised above the wheels and seems to swing from pivots like a large cradle, or such a cot as is used on board ship.

After Alexander's death a funeral car was prepared

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PLATE 2. BRITISH WAR CHARIOT

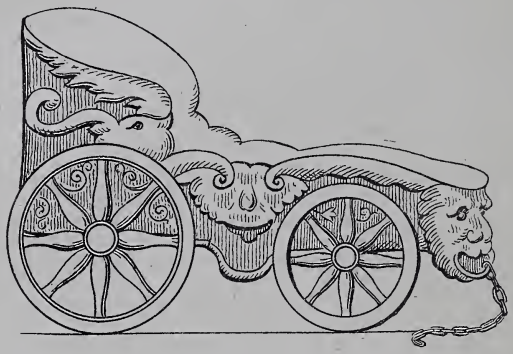


PLATE 3 ANCIENT ROMAN CHARIOT

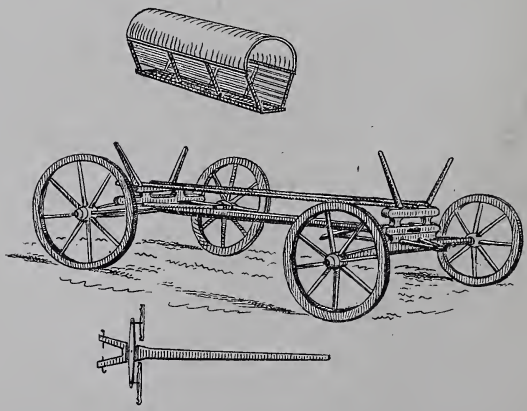


PLATE 4. THE ORDINARY GERMAN WAGGON.

to convey his body from Babylon to Alexandria, in Egypt, a distance of several hundred miles, which car perhaps has never been excelled in the annals of coachbuilding. It was prepared during two years, and was designed by the celebrated architect and engineer, Hieronymus. It was 18 feet long and 12 feet wide, on four massive wheels and drawn by sixty-four mules, eight abreast. The car was composed of a platform with a lofty roof supported by eighteen columns, and was profusely adorned with drapery and gold and jewels; round the edge of the roof was a row of golden bells; in the centre was a throne, and before it the coffin; around were placed the weapons of war and the armour that Alexander had used. This car was thought so much of that several historians have described it, and there are various plans of its appearance, one of which may be seen in Ginzrot's work on ancient carriages in the British Museum library.

The second epoch of the history of carriages I take to commence at the invasion of Belgium and Britain by the Romans. The ancient Britains had used a car for warlike purposes which was evidently new to the Romans. [Plate No. 2.] It was on higher wheels than their cars, it was open in front, and was ascended in the front, instead of, as in their cars, at the back; the pole, instead of sloping up to the horses' necks, went straight out between the horses' bodies, and was broad, so that the driver of the car could stand on it, and if necessary, drive from the end of the pole, or leap out and stand before his horses. It was larger

than a Roman car, and above all it possessed a seat, and was called *essedum* from this peculiarity. At times this car was furnished with scythes, which projected from the axle-tree ends. No doubt the same or a similar car was used by the Gauls and Belgians; but the British *essedum* was the best; and Cicero, writing to a friend in Britain, remarks "that there appeared to be very little worth bringing away from Britain except the chariots, of which he wished his friend to bring him one as a pattern."

When Cassibelaunus was taken prisoner by the Romans, they also captured six hundred cars and four thousand *essedarii*, or car-drivers and warriors. I think we may look upon this vehicle as the origin of the curricle of later years. It is certain that it attracted great notice among the Romans, and under its own name, *essedum*, and with another of a smaller size and with still higher wheels called *cisium*, became the chief and most rapid vehicles upon the public roads, whether in Italy itself, or along the military roads already made into France, Spain, or Germany. Despatches and letters were conveyed with speed and punctuality to the more distant parts of the Roman Empire. The historian Suetonius mentions that the Emperor Augustus established on the military roads active young men at first, and afterwards carriages, to convey his despatches to the governors of the provinces. Besides these rapid conveyances along the public roads, there was the *rheda*, a slow sort of waggon drawn by six or eight mules. Buildings were erected along the main road where these different carriages could be hired. Cicero declares that

a message was sent fifty-six miles in a *cisium* in ten hours. On a monumental column at Ingel, near Treves, is the representation of two persons riding in a *cisium* with one horse. The vehicle is very much like a gig.

Under the Emperors of Rome, the number of kinds and shapes of vehicles increased; but from the vague manner in which the writers of the period speak of them, it is difficult to enter into minute descriptions. The height of the wheels increased. At the capital of Rome, the Emperor Marcus Aurelius is represented in a car of triumph, the wheels of which are as high as the backs of the horses. Sir William Gell, in his work on the ancient city of Pompeii, which was destroyed in the year A.D. 79, mentions that three wheels had been dug out of the ruins in his day—very much like our modern wheels—a little dished, and 4 ft. 3 in. high, with ten spokes, rather thicker at each end than in the middle. Sir W. Gell also gives a well-known picture of a cart used for conveyance of wine in a huge skin or leathern bag; it is a four-wheeled cart, with an arch in the centre for the front wheel to turn under. The pole in this painting appears to end in a fork, and to be attached to the axle-bed. As the wealth of the Romans increased so did their desire to use comfortable and highly-decorated carriages. For many years what are called "sumptuary laws" existed, which regulated each citizen's dress, furniture, and ornaments, according to his rank and consequence, and these laws restrained the decorations upon private carriages.

The Emperor Alexander Severus, however, issued

a decree, "that anyone might decorate his car as he pleased;" and the number of vehicles in use rapidly increased. We find upon monuments many different shaped cars of the time of the Emperors, chiefly processional cars, lofty and highly ornamented, evidently adorned with embossed and chased work in metal, rich carvings, drapery and cushions. On the columns of Theodosius, at Constantinople, are some specially handsome cars on two and on four wheels, with door-like openings in the sides of a square shape. On the arch of Constantine, at Rome, are several cars. Sufficient evidence, however, exists, that for nearly 500 years, during the reign of the different Emperors of Rome, the art of Coachbuilding must have been a good and important business. Besides the ordinary artizans, the woodmen, the wheelwrights, and the smiths, there must have been plenty of employment for the carvers, painters, chasers, embossers, embroiderers, and trimmers.

Homer, as I have mentioned, tells us that the seat of Juno's car was slung upon cords, to lessen the vibration and jolting attendant upon a car without springs or braces; and it is certain that the Roman Emperors were not better off for comfort and ease than Juno was, unless we except one sort of carriage which is described as borne on long poles, fixed to the axles. Now a certain amount of spring can be obtained from the centre of a long light pole. The Neapolitan Calesso, the Norwegian Carriole, and the Yarmouth Cart, were all made with a view to obtaining ease by suspension on poles between bearings placed far apart.

In these the seat is placed midway between the two wheels and the horse, on very long shafts, which are thus made into wooden springs. In the old Roman carriages the weight was carried between the front and hind axles, on long poles or wooden springs. The under-carriage of the later four-wheeled vehicles used by the Romans was, in all probability, the same as is in use in the present day, both in this country and on the Continent, and in America, for the under-carriages of agricultural waggons. There is a work on the subject of ancient carriages which was published at Munich in 1817; it was prepared by John Christian von Ginzrot, who was an inspector in the office of the Master of the Horse of the King of Bavaria. A few copies of this work exist still, but only in the German language, and not easily accessible to the public. This author gives the Greek and Latin names for the pole, perch, wheel-plate, and other technical terms of carriages so fully as to leave no doubt that coach-building was well understood by the Romans. He also gives a plan of a four-wheeled dray [Plate 4], used by the Romans for conveying casks of wine, which is identical with the drays used now in Vienna and Munich. If his authorities be sound, we may be satisfied that the art of coachbuilding, as far as the under-carriage works, and the making of agricultural waggons, was as forward in the days of the Cæsars of Rome as it is to this day in central Germany.

We will, however, quit ancient carriages for those now used in Asia. In Hindostan are a great number of vehicles of native build. It has been frequently

remarked that there is little change in the Eastern fashions, that tools and workmen are precisely as they were a thousand years ago, and the work they produce is precisely the same. In examining what is done now by Indian coachbuilders, we are probably noticing carriages of a similar, if not identical, sort with those in use three thousand years ago. The commonest cart in Hindostan is called "hackery" by Europeans; it is on two wheels with a high axletree-bed, and a long platform, frequently made of two bamboos, which join in front and form the pole, to which two oxen are yoked; the whole length is united by smaller pieces of bamboo tied together, not nailed. In France, two hundred years ago, there was a similar cart, but the main beams terminated in front in shafts; in neither the cart of India nor of France were there any sides or ends; the French cart is called "Haquet;" it is probable that the French, who were in India as well as ourselves, may have given the term "hackery" to the native cart, which was so like their own. The native name, however, is "Gharry." Other carts have sides made by stakes driven into the side beams; the wheels are sometimes of solid wood, or even of stone. Wheels are also made by a plank with rounded ends, and two felloes fitted on to complete the circle. Again, wheels are made like ours, and also with six or eight spokes, which are placed in pairs, each pair close to and parallel with one another.

If a carriage for the rich is required the under-works are like those of a cart, but the pole is carefully padded and ornamented with handsome cloths or velvet; the

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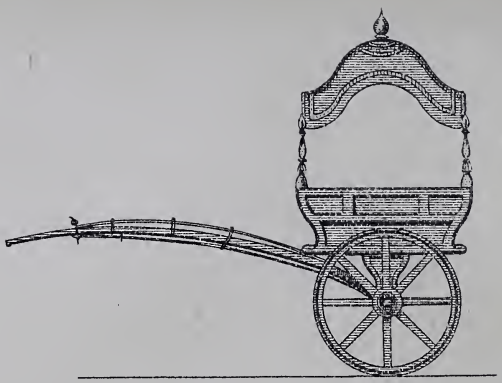


PLATE 5. TWO WHEELED CARRIAGE, HINDOSTAN.

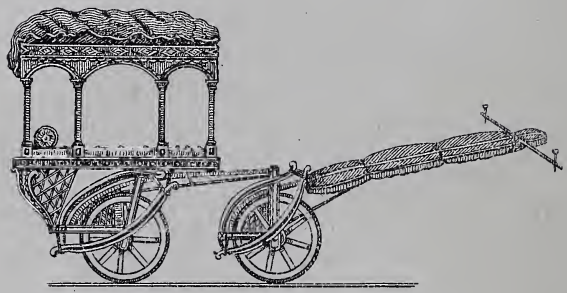


PLATE 6. FOUR WHEELED CARRIAGE, HINDOSTAN.

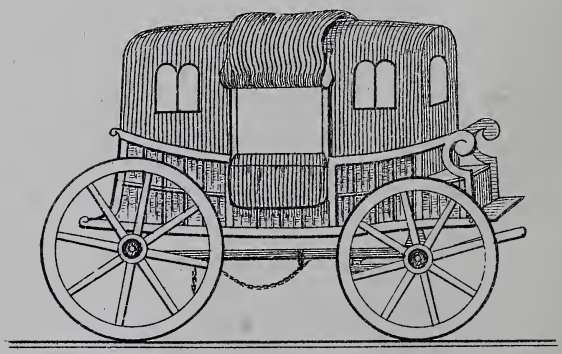


PLATE 7. HUNGARIAN COACH FROM GINZROT'S WORK.

sides of the body are railed or carved, and the top is of a very ornamental character, similar to the howdah of state that is placed on an elephant. It has a domed roof, supported upon four pillars, with curtains to the back and sides [Plate 5]. The passengers ride cross-legged under the dome, on pillows. The driver sits on the pole, which is broad at the butt-end, and he is screened from the heat by a cloth which is fastened to the dome roof and supported upon two stakes which point outwards from the body. A variety of different shaped native vehicles may be seen in elaborate models in the India Museum at South Kensington, but they do not show much originality of design nor beauty of execution, and are said to be really creaking and lumbering affairs. When the Hindoos wished for a four-wheeled vehicle, the plan appears to have been to hook on one two-wheeled vehicle behind another [Plate 6], connecting them with a perch-bolt, and upon the hindermost they placed the body.

There is a singular addition to their vehicles outside the wheels; a piece of wood curved to the shape of the wheel is placed above it, frequently supported by two straight uprights from the end of the axle-tree outside the wheel; this acts as a wing or guard to keep any one from falling out of the vehicle, and also the dress of the passengers from becoming entangled in the wheel. In addition, a long bar of wood, rather longer than the diameter of the wheel, curved in the shape called "cupid's bow," is fastened to the axletree, the linchpin being outside of it, and the ends of the bar tied to the ends of the wing by cords. I imagine it to be placed in order to

be a safeguard for the people in crowded streets, who might be pushed by the throng against the wheel. It will be seen in many of the models, and I have seen it also in ancient drawings of Indian and Persian vehicles. Many of the carts, which are designed to carry heavy loads, have a curved rest from 20 in. to 30 in. long attached to the lower side of the front end of the pole; this serves not only as a prop whilst the vehicle is being loaded, but, should the oxen trip and fall, it supports the cart, and prevents the load, yoke, and harness from weighing down the poor animals as they struggle to recover themselves. In England we have very few of these humane contrivances; we have, however, short rests to prop up a hansom cab when not at work.

In India there are several huge unwieldy structures on wheels called "idol cars;" the name of the car of Juggernaut must be familiar to many. The wheels of some of these are enormous blocks of stone shaped and drilled for the work. In the Indian Museum there is a photograph of an idol car from South India, in the district of Chamoondee and the province of Mysore, which deserves examination. The car appears well proportioned, and the ornamental carvings are beautiful in design, and would bear comparison with most European work.

The *Hecca* or *Heka* is a one-horse native car, resembling an Irish car; it consists of a tray for the body, fixed above the wheels on the shafts, and has a canopy roof; the driver sits on the front edge of the tray, and the passenger cross-legged behind him. The *Shampony* is the usual vehicle for women, which

resembles the former, but it is larger; the wheels are outside the body, and it is drawn by two bullocks; the canopy roof is furnished with curtains that are drawn all round, and the driver sits on the pole in front of the body. All these native vehicles have wooden axles, which, until recently, I am told, were used without grease, from the prejudices of the people forbidding them to use animal fat. Some used olive oil or soap, but in most large towns there are now regulations obliging the natives to use some substance to avoid the noise and creaking of the dry axles. The commonest carriages in Central India are called "Tongas," but the universal native word for a vehicle is "Gharry."

In Calcutta are several coachbuilders of repute, who employ large numbers of native workmen; Messrs Dyke employ six hundred; Messrs Stewart & Co. four hundred; and Messrs Eastman, three hundred. The men are chiefly Hindoos, and are clever and industrious, but have a singular habit of sitting down at their work. The labourers who have to use grease are all Mahomedans. The wages vary from sixpence to two shillings per day.

A representation of a primitive vehicle, which was in use in Hungary not very long ago, is given by Von Ginzrot as representing the Roman *rhedum*. It is very curious, and just such a primitive affair as might be made in any country. [Plate 7.] The body is a disguised waggon; the tilt-top has two leather flaps to fall over the doorway; the panels are of wicker work, such as was in common use for carriages both in Greece and Italy; and of such a character we may suppose the

waggons were, which were used by the many wandering tribes that, in the times of the Roman empire, poured out of Asia and Russia, and invaded Germany, Gaul, and Italy. In the history of Julius Cæsar's wars in Gaul, we are told of the large number of waggons which the savage wandering tribes possessed.

Another primitive vehicle is the Turkish "Araba," [Plate 8] used for the conveyance of women. The lattice-work admits air without too much light. The singular wing-guards over the wheels identify this "Araba" as being derived from the same source as the carriages of Persia and Hindostan. These vehicles have been superseded in many parts of Turkey, Asia, and Egypt by carriages sent from the west of Europe.

In 1860 a carriage was made for one of the ladies of the Sultan's harem, which consisted of silver as far as possible. It cost, it is said, 2,000,000 Turkish piastres, about £15,000, a very expensive present for the ruler of Turkey to make to one out of many wives.

To speak of one more primitive carriage. Dr Edgeworth describes some cars which were in use in his time (that is in 1800) in Ireland, as the common vehicles of the country. They were composed of shafts with cross-bars; two low wheels of solid wood were wedged on to the axle-tree, so as to form one piece, like a railway axle and wheels; they were nearer together than the shafts, and ran inside the shafts; the axle projected beyond the wheels, and moved in sockets beneath the shafts. These cars, Dr Edgeworth says, "cost only four guineas, including painting; they would follow a horse anywhere, they could scarcely be

overturned even with bulky loads, they were light and easily moved by hand, their repair was easy, and they lay so near the ground that they could be easily loaded and unloaded; the whole would turn in a very small compass." It is probable that these were the primitive cars of Ireland. The nearest approach to them in the present day are the costermonger's barrows. We have noticed how light and simple are these vehicles, and that a wretched pony or donkey will canter along with three or even four persons sitting upon them. They also resemble the Yarmouth cart, in which the wheels are inside the shafts; but then the difference is, that the shafts of the Yarmouth carts are of great length, and the load is carried between the horse and the wheels instead of over the wheels, as is usual in a cart. In some parts of Wales cars are used of this construction, and are also supposed to be the primitive cars of that country; their wheels are solid. In Yarmouth this shape was adopted to suit the very narrow streets or alleys, which a cart made with the wheels outside the shafts could not traverse. The great length of the shafts is occasioned by the necessity of carrying a quantity of goods, such as barrels or sacks, which would tend to make the vehicle top-heavy, if piled up above the wheels.

The Irish jaunting car, as now built, is superior to the vehicle of forty years ago. It was then on lower wheels, and being hung lower, the shafts pitched up in front, and the unfortunate passengers were huddled upon one another at every jolt in the road. This car was very light, a great benefit for the horse; it is easily

turned and moved in a crowded thoroughfare, and is capable of conveying more luggage than might at first be supposed. The car is no doubt very cheap, and perhaps more Irish drivers are able to own their own cars than are the drivers of London cabs. Irishmen, perhaps, like the vehicle to which they are accustomed, but it will never become popular in this country.

The car, however, used in Cork, is still more uncomfortable. It is an inside car, that is, instead of sitting back to back, you sit face to face, and to most there is a hood or tilt; a very good vehicle, no doubt, for two persons at a slow pace, but with four persons at a trot it is the worst vehicle I had ever the misfortune to enter. If the Cork car was hung on higher wheels, and the shafts kept parallel to the ground, it would be a better vehicle; if, however, it cannot be balanced properly, it should be placed upon four wheels, like the inside cars of the North of England.

I will mention one more primitive vehicle,—the cart with a tilt, with side windows, and a door behind, which is called a Coburg, and is used in the south-west of England; when on good springs, it is a very cheap and comfortable vehicle. In Belgium and Holland it is much used, and is usually built of a larger size than in England. It is, however, after all, rather like a bathing-machine on wheels. It is to be found pictured in our earliest illustrations of vehicles in old English illuminated manuscripts, differing from the modern Coburg only in the want of a door and springs.

In reviewing what I have laid before you as to

ancient carriages, I would say, that any one who desires to learn more about them can do so in the pages of the *London Carriage Builders' Art Journal* for 1859 and 1860, which appears to contain much of the information given by the German work of Von Ginzrot.

It is interesting to observe the character of the different people illustrated in their carriages. The Egyptians, with all their learning and skill, appear to have made no change during centuries of experience; as at the beginning, so at the end, the kings stand by the side of their charioteers, or hold the reins themselves. The Persians and Hindoos introduced luxurious improvements, and in lofty vehicles elevated the nobles above the heads of the people, and secluded their women in curtained carriages. The Greeks introduced no new vehicles, but perfected so successfully the useful waggon, that their model is still seen throughout Europe, without change of principle or structure. The Romans, on the other hand, in their career of conquest, gathered from every nation what was good, and, wherever possible, improved upon it:—From Greece, the waggons; from Persia, the *harmamaxa* and elevated triumphal cars; and from Hungary, the *rheda*. We may well add that the genius of the Roman nation speaks through Cicero, when he wrote, "I hear that in Britain are most excellent chariots; bring me one of them for a pattern."

CHAPTER II.

Whirlicote of the Middle Ages—Charettes—Cars of the Middle Ages—Revival of Carriages—The first Coaches—The German Waggon—Ancient Saxon Waggon—The Horse Litter—The Old Coaches at Coburg—Early Italian Coaches—Coach of Queen Elizabeth—Coach of Charles I.—Coach of Henri Quatre—Time of Louis XIV.—The Brouette and Steel Springs—The Berlin—Old Coaches at Vienna—Horse Litter at the Imperial Mews—Utility of Steel Springs—Mr Samuel Pepys' Diary—Sedan Chairs—Coachbuilding in 1770—Chariot à l'Anglaise—Encyclopædia on Coachbuilding—Cabriolets—Light Chariots—The Darnley Chariot.

WITH the decadence of the Romans we may well suppose many of the arts of civilisation fell into disuse. The skilled artisans died out and left no successors, for their work was not required, and for some centuries we find little or no mention of carriages.

Ordinary carts were used, it is true, but the great and wealthy moved about the cities or travelled on horseback, and if ill they had litters carried by men or horses. But another cause tended to the disuse of wheeled carriages—the state of the roads.

The Romans had been celebrated for the perfection of their roads; some of these have lasted nearly two thousand years. There is one, called the Appian way, which leads from Rome to near Naples, made B.C. 500 by the Consul, Appius Claudius, which is paved with blocks of stone, and can still be travelled upon after such a lapse of time. Roads like these could easily be traversed by carriages, but

in the course of time they fell into disorder, whilst barbarian tribes had overrun Italy and driven the Romans from Germany, France, and Britain.

The increase of population caused a gradual increase of traffic, and the formation of new roads, which, from the absence of method in making them, soon became mere horse-tracks, and very unsuitable for travelling on wheels for pleasure. We ascertain, however, from old manuscripts and books, that, by degrees, the use of two and four-wheeled carts was revived by the wealthy, in addition to riding on horseback as a means of travelling. The only distinction, however, from common carriers' carts was in the use of carving on the woodwork, and gaily coloured curtains and cushions.

In the reign of Richard II., we find mention of a vehicle termed a whirlicote, viz., a cot or bed upon wheels. The king and his mother rode a whirlicote in 1380, when she was sick, and history tells us that they were much used for the conveyance of ladies, but still more for their luggage. We are told by Stowe that "in the following year King Richard took to wife Anne, the daughter of the King of Bohemia, and she first brought hither the riding upon side-saddles, and so was the riding in those chariots and whirlicotes forsaken except at coronations and such like spectacles." We have here evidence that the chariot and whirlicote of that time were identical. In 1294, Philip, King of France, issued an ordinance prohibiting the citizens' wives the use of cars or chars. In 1267, Charles of Anjou entered Naples, and his

queen, Beatrice, rode in a *Caretta*, the outside and inside covered with sky-blue velvet powdered with golden lilies, and in 1273 Pope Gregory X. entered Milan in a caretta. In an early English poem, the father of a princess of Hungary promises—

> "To-morrow ye shall on hunting fare,
> And ride my daughter in a char;
> It shall be covered with velvet red,
> And cloths of velvet about your head."

Froissart speaks of the return of the English from Scotland in the time of Edward III. in their charettes about 1360. We can therefore trace the word chariot from the original Roman currus, car, char, charette, charet, chariot, as a vehicle used in the middle ages, and gradually becoming that chiefly used in state processions.

When King Henry VIII.'s queen, Anne Boleyn, went to her coronation, she passed through the streets of London; gravel had been strewed all over the pavement that the horses should not slide, and wooden railings were placed along the route; this was on May 31st, 1553. Anne herself was in a litter of white cloth of gold, not covered or bailled, which was carried by two palfreys clad in white damask to the ground, led by two footmen; following her were two chariots covered with red cloth of gold, a third chariot in white, with six ladies in it in crimson velvet; and a fourth chariot was red, with eight ladies in it.

Twenty years later, on September 30th, 1553, Queen Mary Tudor rode through the city from the Tower to Westminster to her coronation in a chariot

of cloth of tissue, drawn by six horses trapped with the like cloth, and a canopy was borne over her chariot. A second chariot had a covering of cloth of silver all white, and six horses trapped with the like, wherein sat Lady Elizabeth and the Lady Anne of Cleves. Then two other chariots covered with red satin, and the horses betrapped with the same. Also forty-six gentlewomen rode on horseback in the procession.

Now what was the shape of these chariots? We are able to judge from a painting of the triumph of the Emperor Maximillian I., on the walls of the Town-hall at Nuremburg, a copy of which is in the Museum at South Kensington, also from a sculpture at Orleans Cathedral [Plate 3], and from an old print of Queen Elizabeth in a chariot. It was an open vehicle on four wheels, rather higher at the back than at the sides, open in front, and containing two or three seats, what the French once called a *char-a-banc.*

M. Roubo has preserved a design of a charette in his work written for the French Academy of Arts, but we cannot have a safer and more reliable model than in a Flemish car or *char-a-banc* now in the Museum at South Kensington; this is a very small vehicle with but two seats, only four people could just sit in it, and it is suspended on leather braces, which we do not know had been introduced into England in Queen Mary's time, but that even is not impossible or improbable. We may, therefore, fairly conclude that in this Flemish car we see an improved representation of what our ancestors used during many

hundred years under the name of whirlicote car, and of different sizes, to carry from four to twelve persons.

About the commencement of the sixteenth century we find that there was a remarkable revival of Coach-building in Italy, France, Spain, and Germany; and it has been warmly debated in which of these countries it commenced, which originated the word coach, and which first suspended a coach upon braces.

I may premise that we find also a vast increase in the size of the wheels used. Up to this period wheels of 4 feet to 4 feet 6 inches seem to have been the limit; but the first coaches, and all their successors for nearly two hundred and fifty years, had wheels 5 feet and upwards in height. I can only suppose that, as soon as any large body had to be conveyed, the model of the vehicle was taken from a timber-carriage, such as must have been in use in all parts of Europe. Secondly, although at first all the wheels of a coach were similar in height, it was soon found necessary, for use in cities, that the coach must turn in a shorter space than a lofty front wheel would allow. Consequently, the front wheel was made lower, and an imperfection was caused, the effects of which have been felt by horse and vehicle to the present day.

In all the claims to the origin of the coach, we must understand that by that word we mean a conveyance in which the roof forms part of the framing of the body—as distinguished from cars and biroches, above which a canopy was often placed by means of iron rods or wooden pillars.

We have further to notice that the vehicles called coaches are distinguished from chariots, by the name of Hungarian coaches, by the Italian writers, and that we must consider a coach to have been not merely a covered, but a suspended vehicle, after the fashion introduced first in Hungary.

Mr Bridges Adams, in his work on carriages, mentions that Ladislaus, King of Hungary, sent an ambassador to King Charles VII., to Paris, and as a present a beautiful carriage, the body of which "trembled;" it is considered that this coach was suspended upon leather braces, and was a specimen of the coaches already in use in Hungary.

The word coach in all European languages has the same sound, and is derived from the town of Kotze in Hungary, where coaches were first built, just as Landaus and Berlins were so named from the cities that first produced them. The coach from Hungary was given to Charles VII., at Paris, in the year 1457. In 1474, the Emperor Frederick III. rode to Frankfort in a coach covered and suspended. In 1509, the Pope Paul III. visited Ferrara, and was met by the duke with a train of sixty coaches, whilst to make it clear that these were not the cars, the historian mentions that the Duchess of Ferrara rode in a litter, and her ladies followed her in twenty-two cars. At this period, 1550, there were only three coaches in Paris, one belonging to the Queen of Francis I., another to Diana of Poitiers, and a third to a corpulent nobleman who could not mount a horse. There must have been many other vehicles in France,

but, it seems, only three covered and suspended coaches. In 1594, the Margrave of Brandenburg, father of the first Duke of Prussia, had thirty-six coaches, each with six horses.

We will now consider what was the origin and the shape of these coaches. It is in the German waggon that we find the origin of the coach. Throughout Germany, Russia, France, and other parts of Europe, the chief agricultural vehicle is the waggon. [Plate 4.] It is of the same form now that it was a hundred years ago. The under part is similar in its construction to our timber-waggons, and, like them, it is capable of being lengthened or shortened at pleasure. The wheels vary in height, according to the requirements of the owner and the country, and the chief purpose for which it is used. As in our timber-waggons, the wheels are sometimes 4 feet and 5 feet high, and sometimes they are as low as 2 feet 8 inches in front and 3 feet 6 inches behind, but the usual size is 3 feet 6 inches in front and 4 feet behind, the track on the road between the tyres is but 4 feet, and the centres of the axle-trees are about 7 feet apart. The carriage is composed of a transom in front, with a perch (as we name the long piece of timber that unites the front and hind wheels) fastened to it. There is a hind axletree bed formed of two pieces of timber, clipped together, between which the wings are notched in; these wings meet together above the perch to which they are united by a strong iron pin. The under works consist of a front axletree bed, also made of two pieces

clipped together with two futchels notched in between, and meeting in a point in front, and spreading outwards behind the axletree bed; a long sway bar, generally quite straight, rests on the futchels and bears against the under part of the perch. Our word futchels is derived through the French word *fourchils*, from the Latin *furca* or fork. The pole of these waggons has at the hind end two wings fixed by iron hoops; the wings are fitted outside the front end of the futchels and are secured by two moveable iron pins. This method of attaching the pole is very ancient; it was in use in the time of the Romans, and may be traced in old pictures. The horses are harnessed to splinter or drawing bars; the longest of these is attached to the pole by a bolt or pin. When the load is light, it is common to harness one horse only to the left or near side of the pole. The under works being thus complete, a body is formed by two long fir poles laid from the top of the transom to the top of the hind axletree bed, about 18 inches apart, with two planks between. Outside the poles are four standard posts, about 30 inches long, which rise upright from the transom and axle-beds, but which, viewed from behind, spread outwards from four to six inches each towards the wheels. The sides are formed by planks resting against these standard posts, and the ends of the waggon are also moveable. The body is thus much narrower at the bottom than at the top. We shall find that this shape pervades all the early vehicles used by the wealthy classes, showing very plainly the original type of the coach.

When the waggon is thus fitted up with plank sides, it can carry earth, manure, or roots. When the farmer wishes to transport a load of hay, the planks are removed, the carriage is lengthened two or more feet, and the sides are formed by long and high hurdles. If a large cask of wine has to be transported, the sides are removed and the cask placed upon the centre of the poles, and, as the waggon moves along, the poles may be seen to sway slightly up and down under the weight of the cask, as the poles of a sedan-chair, or palankeen sway, suggesting, as I hope to show hereafter, a means of forming a species of spring for the ease of anyone riding in the waggon.

We find, then, at a very early date, that waggons were chiefly employed for the conveyance of agricultural produce or the transport of merchandise and the goods of the upper classes. It was also easy, by placing planks across the sides, or suspending seats by straps from the sides, to use the waggons for the conveyance of men and women. But we have evidence that they were made still more free from jolting. In an ancient Saxon manuscript treating on the book of Genesis and the history of Joseph in Egypt, there is an illustration of the meeting of Joseph and Jacob. The father is seated in a two-wheeled cart drawn by a pair of oxen, but Joseph is seated in a hammock, suspended by iron hooks from the standard posts of one of these waggons which I have been describing. This manuscript is supposed to be of the eleventh century, and the artist would be likely to represent only what

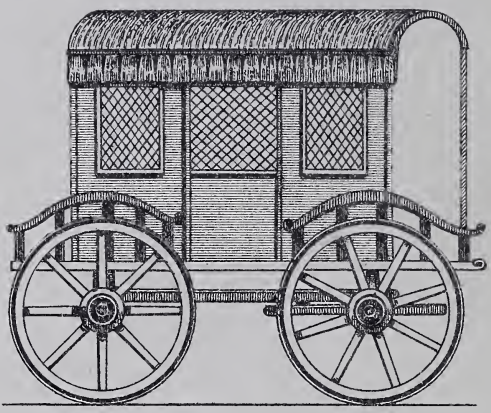


PLATE 8. THE ARABA OF TURKEY

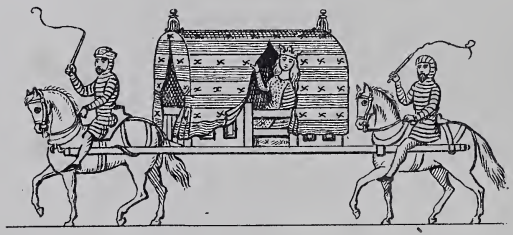


PLATE 9. ANCIENT HORSE LITTER

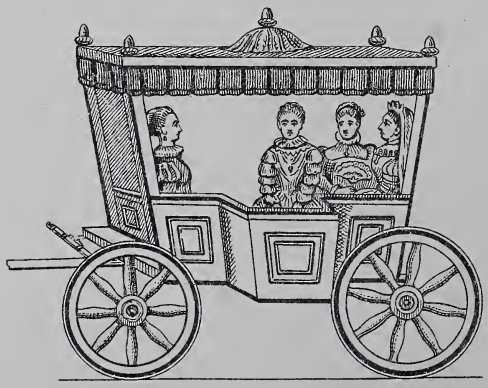


PLATE 12. A COACH OF QUEEN ELIZABETH.

was in use in his own time for the easy conveyance of great people.

The next step, however, in the advance of Coach-building, would be the use of a better body than that of a mere cart. Such was the case with the Horse Litter [Plate 9]. These were long and narrow—long enough for a person to recline in—and no wider than could be carried between the poles which are placed on either side of the horses. They were about 4 ft. to 5 ft. long, and 2 ft. 6 in. wide, with low sides and higher ends. The entrance was in the middle, on both sides, the doors being formed sometimes by a sliding panel and sometimes simply by a cross-bar. The steps were of leather or iron loops, the latter being hinged to turn up when the litter was placed on the ground. The upper part was formed by a few broad wooden hoops, united along the top by four or five slats, and over the whole a canopy was placed, which opened in the middle, at the sides and ends, for air and light. The first pleasure-waggon bodies were made in a similar fashion to the horse-litters, but rather longer and wider, with similar doors. By degrees these bodies were ornamented with carving, and the slats of the tilt-top were exchanged for poles, whose ends were ornamented with metal rosettes, or animals' heads, and gilt. I have not found any certain date at which these bodies were first suspended upon straps or braces. The suspension of a hammock from the standard posts of a waggon, and of the litter from the harness of the horses, would, however, suggest the suspension of these improved waggon bodies from the same standard

posts. I have seen in a very early picture in oil, at Nuremberg, two waggons such as I have described, with carved and gilt standard posts both in front of and behind the body, the tilt-tops have the middle of the sides cut out square, and made to turn over the top, and the driver sits outside the waggon body between the standards.

We have, however, at Coburg, the capital of Saxe-Coburg, several ancient vehicles preserved, which are among the oldest in Europe. One of these was built for the occasion of the marriage of the Elector of Saxony, Duke John Cassimir, in 1584, to Anne of Saxony [Plate 10]. It has leather braces and high wheels, which measure 4 ft. 8 in. and 5 ft. in height; the distance from centre to centre of the axle-trees is 10 ft. 6 in. The carved standard posts, from which the body hangs by the leather braces, are evidently developed from the standards of the common waggon. The body is 6 ft. 4 in. long, but only 3 ft. wide. The steps have now disappeared. The wheels have wooden rims, but over the joints of the felloes are small plates of iron about 10 in. long.

This coach is not the only one. There is another, rather longer and larger, built for the Duke's second marriage, in 1599, with the Lady Margaret. There is also a smaller coach-body built for the Duke John Frederick, as early as 1527, for his marriage with Sybilla of Cleves. This small coach was shown this year at the Exhibition of arts at Munich; the iron loops by which it had been suspended are still on the body.

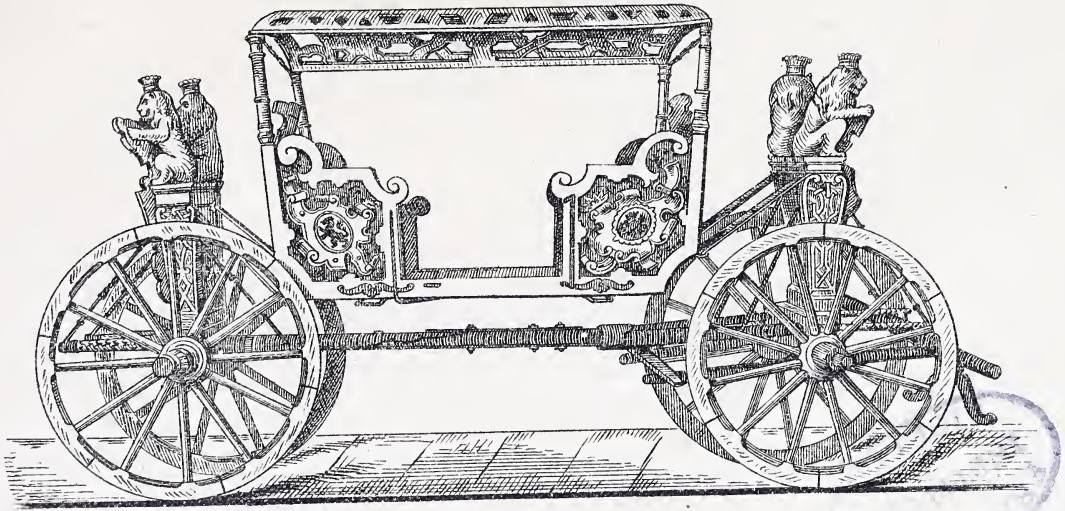


PLATE 10. WEDDING COACH OF DUKE OF SAXONY,

There are also two small Coach bodies, which are to be seen at Verona, and are shown at the Palace Sarego Allighieri, with the story that they were used by Dante the poet. This is a fable. Count Gozzadini, in his recent work on ancient coaches, says that, by the heraldic shield still on one coach, he finds it was built in 1549, at the marriage of Ginevra, the last of the race of Dante Allighieri, with Count Marc Antonio di Sarego. This Coach, as may be seen in Plate 11, is beautifully shaped and ornamented. Both are but skeleton bodies, and had to be covered to keep off the sun or rain, with leather, cloth, and silk curtains.

There are curious sumptuary laws cited by Count Gozzadini as enacted during the sixteenth century in various Italian cities, against the excessive use of silk, velvet, embroidery, and gilding in the coverings of coaches and the trappings of horses.

In 1564, Pope Pius IV. exhorted the cardinals and bishops not to ride in coaches, according to the fashion of the time, but to leave such things to women, and themselves ride on horseback. Duke Julius of Brunswick issued an edict in 1588, that his subjects should desist from indolent riding in coaches, and should return to the useful discipline of riding on horses.

The use of coaches in Germany, in the sixteenth century, was not less than in Italy; the current of trade, especially from the East, had for a long time poured into those two countries towards Holland, enriching all the cities in its progress, and the rich traders built fine houses, and churches, and town halls, and would have their coaches handsomely decorated

as well as their houses. Macpherson, in his history of commerce, says that Antwerp possessed five hundred coaches in 1560, in the time of Queen Elizabeth. France and England appear to have been behind the rest of Europe at this period.

The first coach was made in England in 1555 for the Earl of Rutland, by Walter Rippon, who also made a coach in 1556 for Queen Mary, and in 1564, a state coach for Queen Elizabeth; in 1580, the Earl of Arundel brought over a coach from Germany. Queen Elizabeth, however, preferred the use of a coach [Plate 12] which William Boonen brought her from Holland in 1560, and made him her coachman. This William Boonen's wife brought out of Holland the art of clear-starching, and was appointed to prepare the Queen's famous cambric ruffs, which in pictures of her are displayed round her neck. Taylor, called the water-poet, says that old Parr gave him this information in 1605, and adds that since, "coaches have increased with a mischief, and have ruined the trade of the waterman by hackney coaches, and now multiply more than ever." Another writer complains that "now the use of these coaches brought of Germany is taken up and made common, that great ladies caused coaches to be made for them, and rid in them up and down the counties to the great admiration of all the beholders, and little by little they grew usual among the nobility and others of quality, so within twenty years there grew up a great trade of Coachbuilding in England."

A curious tract or pamphlet was published in Lon-

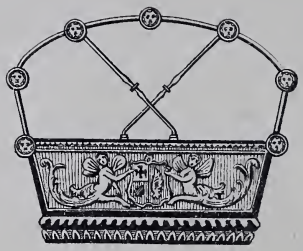


PLATE 11. BACK VIEW

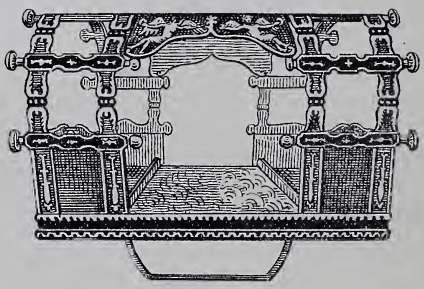


PLATE 11. ANCIENT ITALIAN COACH, 1549.
SIDE VIEW

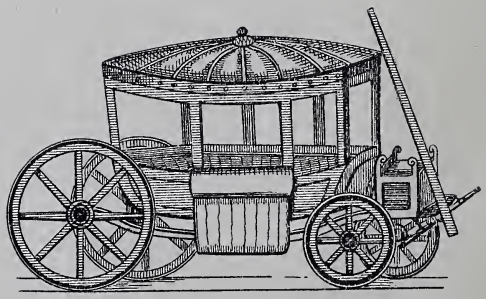


PLATE 13. COACH OF TIME OF CHARLES 1ST (FROM AN OLD PRINT)

don in 1636, entitled "A Dialogue between a Coach and a Sedan-chair." In the figure of the coach, as given in this tract [Plate 13], there are no leather braces marked, but the artist may have omitted what he considered unnecessary details, just as the artists of the present day, making a cheap view of a procession, will figure coaches and chariots of a shape that was obsolete fifty years ago, and even in pictorial journals that should draw better, the shape and details of carriages are unfaithfully rendered. Still, on the whole, we may consider this gives the coach of the period—a long body, a domed roof, the sides open, with curtains to draw down when requisite, no door, but a leather screen hung across the doorway, a very small coachman's seat, and swingletrees for the horses' traces.

In 1641, on November 25th, Charles I. passed through the City of London on his return from Scotland, and banqueted with the citizens at Guildhall. He was met at Kingsland by the city authorities and five hundred liverymen of the city companies on horseback, each with his footman and torch-bearer, and was accompanied to Whitehall after the banquet by the liverymen with their torch-bearers. It is worthy of notice that the king's coach is the only coach spoken of, and that the King, Queen, the Elector Palatine, their brother-in-law, the Duchess of Richmond, and three of the royal children, seven persons in all, rode therein. Plate 14 shews a coach of this period.

In France, King Henry IV. was assassinated in his coach by Ravaillac on May 16th, 1710. The account

states that the coach was surrounded by blinds or curtains, but the king had drawn them back that the people might see him; with him in the coach were seven noblemen, that is, two persons on each seat, and two in each boot. A drawing of this coach has been preserved [Plate 15], by which we see the roofs and supports (somewhat resembling the outline of a Roman or Asiatic vehicle) and the curtain hanging over the doorway in front of the boot.

A coach belonging to a Duke of Saxe-Coburg is still to be seen at the castle at Coburg; in this the body is 7 ft. 6 in. long in the middle, the wheels are 4 ft. and 4 ft. 10 in. high, the roof and upper quarters are of black leather nailed on with brass nails, the heads as large as a sixpence and rounded. On either side of the doorway are iron bars to form the sides of the boot, and the doorway is guarded by a wooden cross-bar padded which drops upon two pins, and from which bar the curtain would fall over the doorway. With such a length of body we can understand how eight persons could ride in it. In prints of this period all coaches are drawn like this, with the bodies suspended on leather braces—with domed roofs and with the front wheels generally rather low—with a coachman seated upon a cross-bar or cushion suspended between the two front standard posts, and his feet upon a board projecting at the bottom of the posts over the pole.

Some coaches are depicted so wide that they may have held three persons on each seat, but the general appearance is that of Louis XIV.'s first coach [Plate

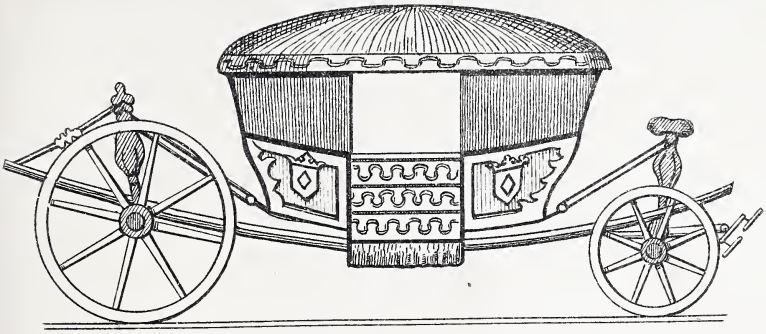


PLATE 14. COACH OF PARIS IN 1646

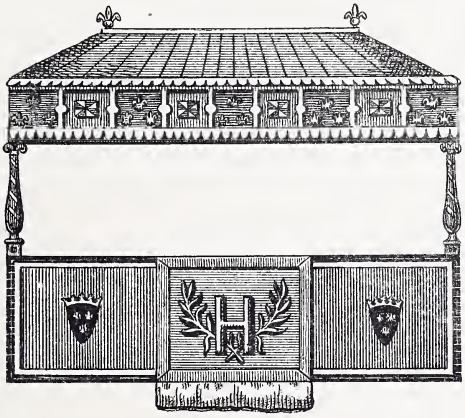


PLATE 15. COACH IN WHICH HENRI IV WAS SHOT

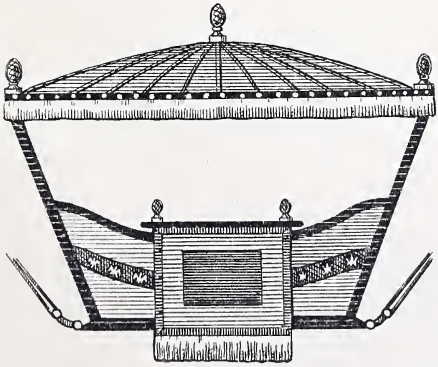


PLATE 16. COACH IN WHICH LOUIS XIV ENTERED PARIS IN 1654.

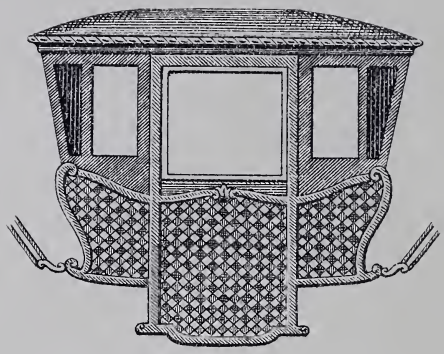
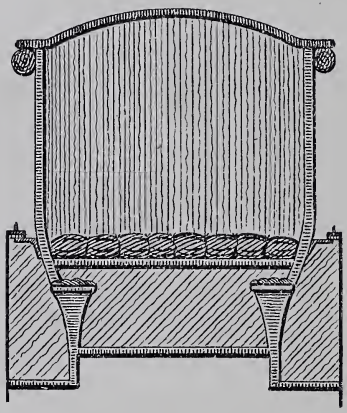


PLATE 17. COACH OF LOUIS XIV IN 1700



SECTION

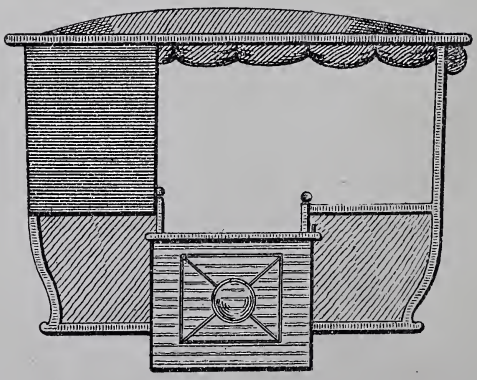


PLATE 18. THE CORBILLARD AN EARLY FRENCH COACH.

16]. No trace of glass windows or complete doors seems to have existed up to 1650. But plain and rude as was the first coach of Louis XIV. it was in his reign, which lasted till 1715, that the most rapid progress was made in Coachbuilding. From the simple waggon-like skeleton body was developed by degrees a beautifully shaped, carved, and panelled piece of cabinet work [Plate 17], such as we can justly allow to be worthy the name of a coach, and this delighted our ancestors in the reign of Queen Anne. The credit of this transformation is equally due to Germany, Italy, France, and England ; in each country improvements seem to have been made simultaneously.

The following is the description by a French author, M. Roubo, of the change that took place in Louis XIV.'s reign. The corbillards are the earliest French coaches of which we know the exact form. [Plate 18.] These were straight-bottomed, open at the upper sides or quarters, which were furnished with curtains of cloth and leather; at first these were tied on, and would roll up when air was required; they had no doors, but were entered on either side by a moveable rail, over which a leather screen was hung. Behind these screens were seats, a little above the floor, where the pages of the owner of the carriage sat sideways. Sometimes there was a projection on either side called a boot, in which the pages sat.

The next coaches had curved bottoms, and were made with a wooden door half-way up the body, and the whole of the lower part of the body was panelled instead of being covered with cloth; this change is

supposed to have taken place about 1660. As the coach began thus to be built in, carving, gilding, and painting were introduced, and beauty in shape increased. Next came the introduction of glass to the sides. A complete door reaching to the roof, with sliding glasses, followed.

There is very little mention made by historians of steel springs, but they were first applied to wheel carriages about 1670. At this period a vehicle drawn by men, and called a *Brouette* (or wheelbarrow) was introduced at Paris. [Plate 19.] It was a sedan chair, to hold one person, with the door in front like the sedan chairs are now made, but on two wheels, about 3 ft. 6 in. high, and with two poles or shafts projecting forward, between which one man ran, whilst another pushed behind if the weight required it. There is a vehicle now much in use in Japan and China that seems a revival of the brouette; I think it is called a Jin-rik-sha.

The brouette was improved by Dupin, who applied two elbow-springs beneath the front, and attached them to the axletree by long shackles, the axletree working up and down in a groove beneath the inside seat. This is the first record of the application of steel springs to carriages. Many bath-chairs have springs from the body to the axletree in this method, and there is a tradition in the north of England that small broughams, on two wheels drawn by men, were used sixty years ago, as well as sedan chairs, for the conveyance of ladies to evening parties.

It has been said that a Mr Thomas brought springs

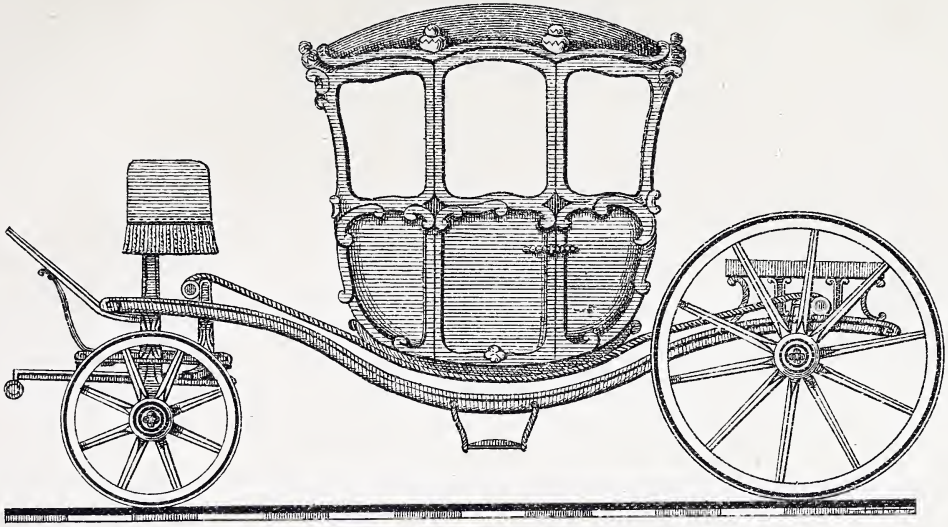


PLATE 20. THE BERLIN, FROM ONE NOW AT VIENNA

first before the notice of the scientific body of the Academy at Paris in 1703, but this is erroneous. The spring Mr Thomas mentioned is a small spiral spring to be placed between the double leather brace of a carriage. [See this spring in Plate 28.]

The first application of steel springs to a coach was beneath the bottom of the body; the loop of the brace was hinged, and between the body and the loop were placed two elbow-springs. [Plate 19.]

The Company of Coach and Coach-harness Makers was founded in May 1677 by Charles II., and was confirmed by King James II. in the third year of his reign.

In Germany, there was invented about 1660 the vehicle called the Berlin. It will be remembered that in the German waggon the bottom of the body is formed by two long poles, which afford a certain amount of spring when weighted only in the middle. Acting on this principle, Philip de Chiesa, a Piedmontese in the service of Frederick William, the Duke of Prussia, invented and built a carriage, which received the name of Berlin. [Plate 20.] It had two perches instead of one, and between these two perches, from the front transom to the hind axletree bed, two strong leather braces were placed, with jacks or small windlasses, to wind them tighter if they stretched. The bottom of the coach was altered from being straight to an easy curve, and it was fixed upon these braces of leather, which allowed it to play up and down with the motion of the carriage, instead of swinging to and fro from four high posts. Philip, the inventor, died in 1673.

In the Imperial mews at Vienna are four coach berlins, which, I think, may belong to this period. They are said to have been built for the Emperor Leopold, who reigned at Vienna from 1658 to 1700, and Kink describes this emperor's wedding carriages as covered with red cloth and as having glass panels; he also says they were called the Imperial glass coaches. It is possible that the coaches have been a little altered from the time of their construction, but I consider that in these four we have the oldest coaches with solid doors and glasses all round that exist in Europe. Whether they are identical with the Emperor Leopold's wedding carriages matters much less than the influence the Berlin undoubtedly had upon the Coachbuilding of that period. It was the means of introducing the double perch, which, although it is not now in fashion, was adopted for very many carriages both in England and abroad, up to 1810. Crane-necks to perches were suggested by the form of the Berlin perch; and as bodies swinging from standard posts suggested the position of the C spring, so bodies resting upon long leather braces suggested the horizontal and elbow springs to which we owe so much. The first Berlin was made as a small *vis-à-vis* coach—small because it was to be used as a light travelling carriage, and narrow because it was to hang between the two perches, and was only needed to carry two persons inside. It was such an improvement in lightness and appearance upon the cumbersome coaches that carried eight persons, that it at once found favour, and was imitated in Paris, and still more in London.



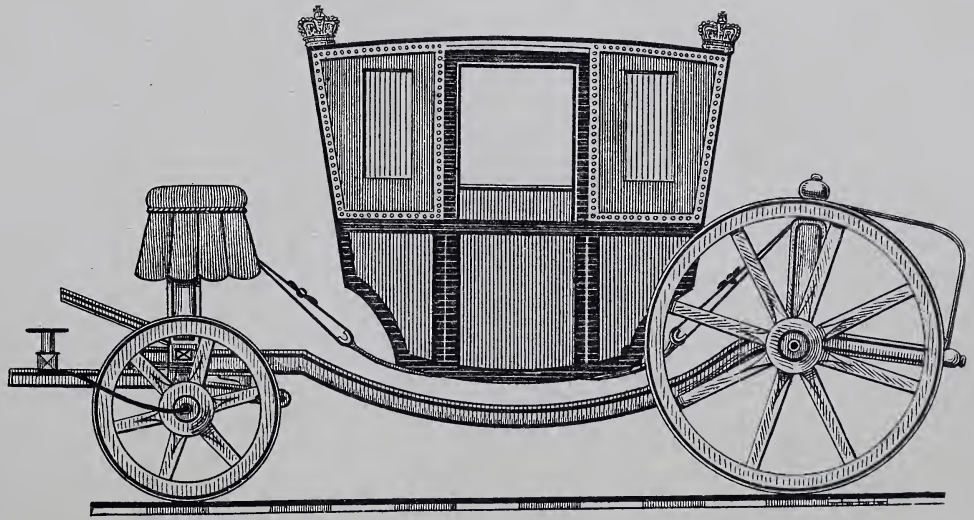


PLATE 22. COACH OF TIME OF CHARLES 2ND

At Vienna there is also to be seen a horse litter of this period [Plate 21], which is interesting as another specimen of a small *vis-à-vis* coach with glass windows. In shape it exactly resembles the coaches on the arms of the Coach and Coach-harness Makers' Company of the City of London. [Plate 22.] It is a singular instance of the length of time that some old patterns exist, that this horse-litter exactly resembles the shape of the sedan chairs still in use at the public baths at Ischl, in Austria—that is, if this litter were cut in half, you would have two sedan chairs. It is said that the Spanish wife of the Emperor Ferdinand III. rode in a glass carriage, so small as to contain two persons only, as early as 1631. It is possible that this horse-litter may be the carriage spoken of. Glass was in common use then for windows; but plate-glass, such as was used for State coaches in 1700, was not made at all in England until 1670.

Towards the end of the seventeenth century, among the wealthier classes, decoration was applied to coaches to an extent that would surprise us now-a-days. Wheels were again ornamented, as in the times of the old Roman empire; the spokes were shaped and carved, the rims moulded, and the naves highly embossed. The panels had beautiful paintings upon them; sometimes the whole was the subject of a picture in which a landscape and figures appeared, sometimes surrounded with a continuous ribbon border of flower work, or the panels were divided into squares or diamonds of diaper work, each

little partition bearing a flower or device. The inside linings were of brocaded silk or velvet.

But all this century the use and number of coaches in England was increasing, and at length the value of springs in lessening the weight of coaches was fully understood; and this demands a short explanation. First it was found that when the body was suspended upon springs, the vibration, and consequently the wear and tear of not only the body, but in a degree of the underworks or carriage, was reduced, and the entire amount of timber used could be safely diminished, and with it the load behind the horses. And secondly, when the wheels had to be pulled over an obstacle or out of a ditch, the weight of the entire coach had not to be lifted as formerly, since the elasticity of the spring allowed the wheel to rise without lifting all the body and its passengers with it. It is of importance to understand this clearly, and anyone may convince himself by watching the motion of two loaded carts over a bad road, one having springs and the other being without them.

In Mr Samuel Pepys' diary during the year 1665, we find on May 1st, "After dinner I went to the tryall of some experiments about making of coaches go easy. And several we tried, but one did prove mighty easy [not for me to describe here, further than that the whole of the body lies upon one long spring], and we all one after another rid in it, and it is very fine, and likely to take." (This may have been a Berlin car.)

On September 5th he writes, "After dinner comes Colonel Blunt in his new chariot made with springs,

as that which was made of wicker, and wherein a while ago we rode at his house. And he hath rode he says now, this journey, many miles in it with one horse, and outdrives any coach, and so easy he says. So for curiosity I went in it to try it, and up the hill to the heath, and over the cart ruts, and found it pretty well, but not so easy as he pretends."

In 1666, January 22nd, "I went with Dr Wilkins, Mr Hook, Lord Brouncker, and others, to Colonel Blunt's, to consider again of the business of chariots, and to try their new invention, which I here saw Lord Brouncker ride in, where the coachman sits astride upon a pole over the horse, but do not touch the horse, which is a pretty odd thing."

In 1668, November 5th, Mr Pepys went with Mr Perry all the afternoon among the Coachmakers in Cow-lane, and "did pitch upon a little chariot, whose body was framed but not covered, it being very light, and will be very genteel and sober."

December 2nd, "Abroad with my wife, the first time that I ever rode in my own coach."

In 1669, April 19th, "Calling about my coach which hath been to the Coachmakers to be painted and the window frames gilt again." We see from this entry that in 1669 coaches were made in England already with glass windows.

April 30th, "To the Coachmaker's, and find many ladies sitting in the body of a coach, which must be finished by to-morrow, the Lady Marquess of Winchester and Lady Bellasis eating of bread and butter and drinking of ale; my coach is silvered over, but

no varnish yet laid. I stood by it till at eight at night, and saw the painters varnish it, and it dries almost as fast as it can be laid on. I sent the same night my coachman and horses to fetch the coach home;" and on May 1st, "At noon to dinner, and after through the town with our new liveries of serge, and the horses' manes and tails tied up with red ribbons, and new green reins."

Sedan chairs came into fashion in England in 1634, and were in general use by the middle of the century. The alteration in the form of the coach, from the long barge shape of Charles I.'s time to that of Charles II. was, no doubt, suggested by the shape of the sedan chair, in London as well as in Germany.* The improvements mentioned by Mr Pepys show that coaches were being altered, but the progress of springs was slow. We appear, in England, to have taken the lead, in at the same time introducing springs and lessening the weight of coaches. In 1770, an elaborate treatise on Coach-making was published at Paris by the Academy of Arts, written by Mons. Roubo. In this work we find that even at Paris then, springs were not at all universal. They were applied to the four corners of a perch carriage, and placed upright, and at first only clipped in the middle to the posts of the earlier carriages, and the leather braces went from the tops of the springs to the bottoms of the bodies, without any long iron loops such as we now

* See cover of this book for the shape of a coach of this period, and also Plate 22.

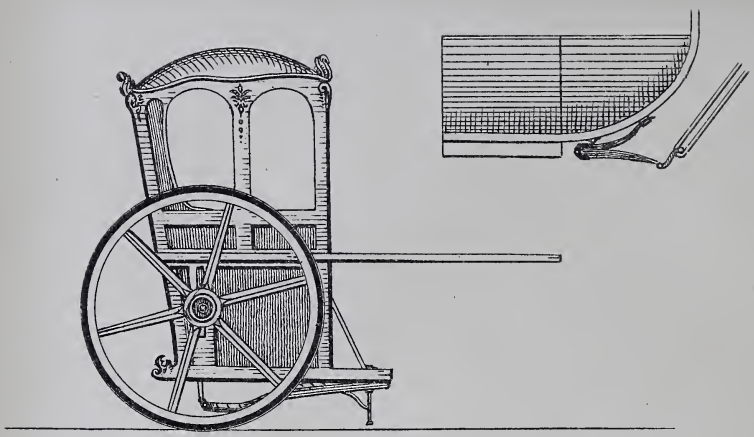


PLATE 19. BROUETTE OF PARIS, 1670.

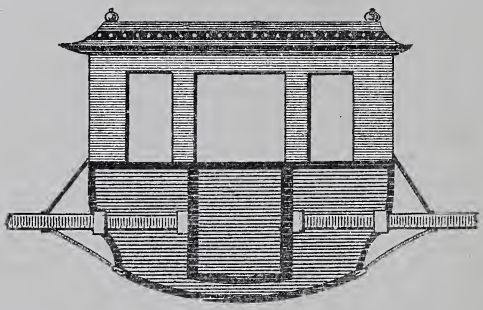


PLATE 21, LITTER TO BE CARRIED BY HORSES NOW AT VIENNA.

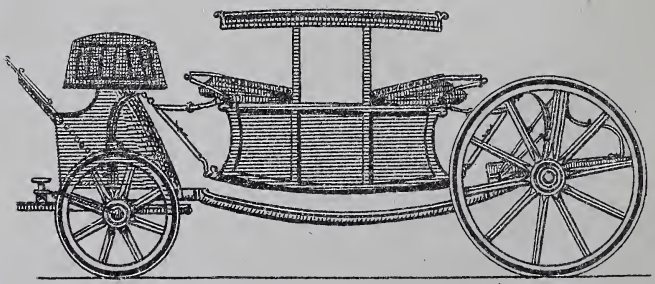


PLATE 23. THE FIRST LANDAU, (FROM AN OLD DRAWING)

use; and, as the braces were very long, we find that complaints were made of the excessive swinging, tilting, and jerking of the body. Another method of the application of springs was beneath the body. The Queen's coach is thus suspended. Four elbow-springs, as we should call them, were fastened to the bottom of the body [Plate 19, Figure 2], but again the ends did not project beyond the bottom, and the braces were still kept too long; Mons. Roubo doubts whether springs were of much use.

It seems clear from this work, that one hundred years ago the art of Coachbuilding was in some respects equal to that of the present day. Their timber was carefully selected and dried, the bodies were framed and panelled, the shape, and curves, and side sweep, and turn-under was regulated by very careful drawings, the grooves for the blinds and glasses were well made. Blinds were made both panelled, perforated, and to open, just the same as those which we call venetian blinds, and a fourth sort with fixed open slats, as are now used in Turkey and India. Panels were then, as now in France, chiefly of walnut-wood, and M. Roubo describes the method of curving them by wetting one side and exposing the other to a hot fire. He also gives designs for the various tools used by the woodmen and the smiths. He enumerates the various classes of workmen, including painters and trimmers, and adds "all these are independent workmen, yet who should have a knowledge of one another's work, that the work of

one hinders not the work of another, their mutual knowledge should concur in the acceleration and perfection of the whole."

Coaches at this period were hung comparatively high, being necessarily above the perch. Berlin Coaches or Vis-à-vis were hung between two perches, and therefore nearer to the ground. The body of some Berlins also had a solid top or roof, but the sides and ends were of leather, which could be rolled up to admit of more air. These may have given the idea of a singular carriage which preceded the Landau. [Plate 23.] Some coaches had windows in the side quarters. A few were still made to hold eight persons inside. The shapes admitted of considerable variety; the elbow line was straight or in three or four curves; the quarters either what we call the britchka quarters, or a concave single sweep from the elbow to the end of the bottom side, like the shape of Her Majesty's State Coach. Chariots were made with the hind quarter similar in shape to the front pillar, that is with a concave sweep. M. Roubo goes on to tell us that chariots, being smaller than coaches and lighter, were at first called diligences. But in consequence of the speedy passage of a stage coach from Paris to Lyons, it obtained the name of diligence, which has since remained to those large double coaches still in use on the Continent. We also find the drawing of an invalid or Dormeuse coach, very ingeniously contrived, and descriptions of the different summer open carriages, some with and some without springs; there are a few of really elegant shapes. He enumerates

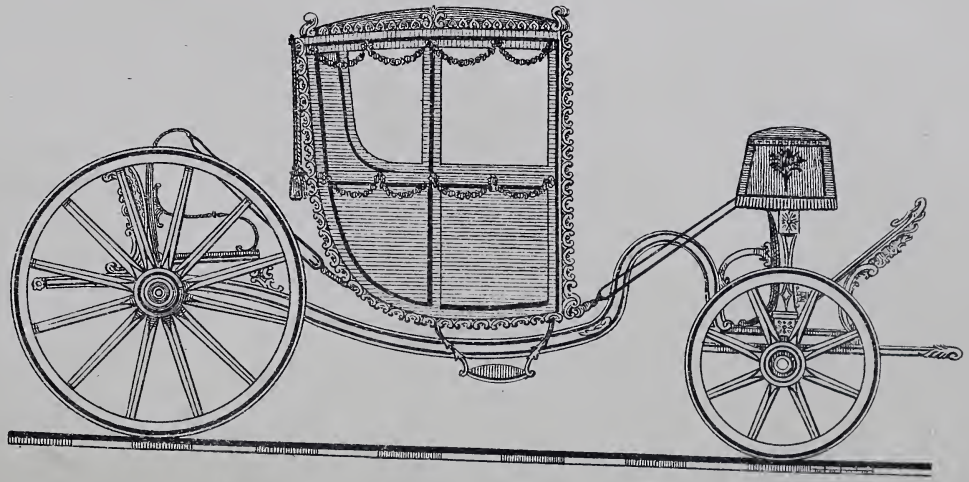


PLATE 24 CHARIOT À L'ANGLAISE, AFTER M. ROUBO

chaises, phaetons, cabriolets, caleches, "*Anglaises des-obligeants*" (or what we should call sulkies, that would only contain one person), lastly and the wourst, a vehicle introduced from Germany for sporting, and which is a Russian drosky, but very much longer than those we have seen in England, there is a crane neck in the perch to allow the wheel to turn, and the seat, which is hung on braces, is very narrow, for the passengers to sit on it astride.

M. Roubo describes at length, and gives a plan of the Anglaise. It is a chariot, with the modern curved lower quarter panel suspended upon a double swan-necked perch, rather high front wheels, and four whip springs, and with a small hammer-cloth in front. [Plate 24.] There is one very similar preserved in the Museum of the Hotel Cluny at Paris. But on this vehicle M. Roubo remarks, "I see no beauty nor grace in the *voiture à l'Anglaise*, but it is no doubt sufficient that the invention of this vehicle comes from England, to make all the world desire to have them, as if there existed some law which obliges us to be the servile imitators of a nation who is our rival, and which, although it is respectable, and admirable even, in some respects, can never be equal to us for works of taste in general, and above all in Coachbuilding."

Whilst we may smile at M. Roubo's jealousy, we must allow the general truth of what he says, viz., that in works in which taste reigns paramount, the French do usually surpass the English; and as regards Coach-building, although we have the name for superior vehicles, and deservedly so as regards quality, dura-

bility, and ease, the French are beyond us in applying tasteful painting, trimming, and decoration of all sorts.

In the French Encyclopædia of 1772, by Diderot, there are elaborate descriptions of the art of Coachbuilding, the workshops and tools used, and plates of the different carriages in use. I have mentioned these two works, one by M. Diderot on his own account, and the other by M. Roubo for the French Academy, partly to shew the great care taken by our neighbours to instruct the people in the technical principles on which their manufactories should be conducted. It may be that having these superior models before their eyes, and being assured by the wise men of the day that thus carriages should be constructed, the French Coachbuilders were content with their achievements, and allowed other nations to advance more rapidly, during the remainder of the century, with daring innovations in lighter and easier vehicles.

But the teaching of the Academy would nevertheless tend to create a careful and thoughtful body of workmen, who, if they developed but slowly, would develop carefully, and turn out good work in their generation.

There is one vehicle which appears almost solely in this epoch, and had a marked effect in introducing our English post-chaise. This was the *chaise de poste*. [Plate 25].

From the engraving and description in the Encyclopædia it appears to have been a small chariot body, very little longer than a sedan chair, and like a sedan chair, it had the door in front; this door was hinged at

the bottom, and fell forward on to a small dasher like a gentleman's cabriolet; there was a window in each side. It was hung upon two very lofty wheels and long shafts for one horse, and the body was rather in front of the wheels, so that the weight on the horse's back must have been considerable. It was suspended at first upon leather braces only, but later upon two upright or whip springs behind, and two elbow springs in front from the body to the cross-bar, which joined the shafts and carried the steps.

Count Gozzadini tells us that in 1672 Cabriolets, or gigs with hoods, were introduced from Paris into Florence—"an affair with a curved seat fixed on two long bending shafts, placed in front on the back of a horse and behind upon two wheels; to this was given the name of gig, and they so increased in number that in a few years there were nearly a thousand in the city of Florence."

These vehicles, in which the shafts were really very long, appear to be the origin of the carriole of Norway, the calesso of Naples, and the volante of Cuba. In the Museum at South Kensington we have a specimen of one of these, adorned with much elegant carving. It has no hood. The seat is very small. Beneath the shafts are two long straps of leather and a windlass to tighten them; this apparatus was, no doubt, to regulate the spring of the vehicle to the road travelled over.

There was a small-sized vehicle in use called *Cabriolet*, the body only a shell, with a hood which would put up and down, composed of three iron hoop-

sticks, jointed in the middle to fall upwards; the setting joints are straight, the covering appears to have been cloth or canvas.

Although these French books appeared about 1770, they describe carriages that had been a long time in use.

In the meantime the English had been making a great many small chariots. Dean Swift, in 1770, speaks in his journal of driving down to Hampton Court and to several gentlemen's country houses near London in a chariot and pair of horses, to dine with some great man, and returning after dinner to town. He mentions that he could not have done the same in the neighbourhood of Dublin on account of the absence of turnpike roads. He drove from Windsor to London, twenty-three miles, in two hours and forty minutes, and from Wycombe to London, twenty-seven miles, in five hours, and from Windsor to Bucklebury, near Newbury, twenty-six miles, in four hours.

In 1744 Lady Hervey wrote in her "Letters," that light-bodied chariots were then advertised as fit for town or country. As a further illustration of this period, there is a chariot in the South Kensington Museum belonging to the Earl of Darnley's family, which is supposed to have been built in 1750. I should think it is of rather earlier date, probably 1700. The body is small, and abounds in curves and sweeps like furniture of the date of Louis XIV. The glasses of the doors and of the front rise and fall in frames. There is a broad perch, with two iron

handsomely-forged cranes (exactly like those in the *diligence Anglaise*, which, unfortunately, did not please M. Roubo). The body is slung upon leather buckle braces, with small elbow springs at the bottom of the body at the hinder part. There is a small hammer-cloth on which the coachman could sit (the origin of the name is supposed to be from its original use in covering the budget which held the hammer and other tools that were frequently carried with carriages, especially travelling carriages, as late as the year 1840); the footboard is framed to the carriage part. There is a splinter-bar, by which the horses would be attached, and the wheel-irons hook on to this bar, and are attached at the hinder part to the ends of the front axletree. The front wheels are 2 ft. 9 in. high, and the number of spokes eight. The hind wheels have twelve spokes, and are 5 ft. high. The whole is hung low. We can well suppose that this was not a heavy carriage after the horses.

When the first coach quarters were covered with leather, they were nailed on and the heads showed. After 1660 these nail heads were covered with a strip of metal made to imitate a row of beads; from this practice arose the name of "beading," which has been retained, although beading is now made in a continuous level piece, either rounded or angular.

The use of coaches had by this time spread from Europe to the colonies, and in 1740 there were many coaches and chariots in use at Spanish Town, Jamaica, and other large towns in America, wherever colonised by Europeans.

CHAPTER III.

STATE COACHES.

A Coach of Silver—Lord Castlemaine's Coach—Spanish Ambassador's Coach—Ancient Spanish Coach—Austrian State Coach—State Funeral Coach at Vienna—State Coach of England—City State Coach.

IN Count Gozzadini's work on Ancient Carriages there is an account of a State Coach which was built under the direction of an Italian at Brussels, for the ceremony of the marriage of Alexander, the son of Octavius Farnese, Duke of Parma, with a Portuguese princess. The wedding took place in 1565 at Brussels. There were four carriages Flanders fashion, and four coaches after the Italian fashion, swinging on leather braces. The chief, or state coach, is described as built in the most beautiful manner, with four statues at the ends, the spokes of the wheels like fluted columns. There were seraphims' heads at the ends of the roof and over the doorway, and festoons of fruit in relief on the framing of the body. The coachman was supported by two carved figures of lions, two similar lions were at the hind end, and the leather braces that supported the body and the harness were embossed with heads of animals. The ends of the steps were serpents' heads. The whole of the wood and ironwork was covered with gold, relieved with white. The coach was drawn by four horses, with red and white plumes of feathers, and the covering of the body and of the

horses was gold brocade with knotted red silk fringe. The cushions of embroidered gold stuff were perfumed "with amber and musk, that infused the soul of all who entered the coach with life, joy, and supreme pleasure." The horses were cream colour. All this description would fit very much with the coach of the Duke of Saxe Coburg built twenty years later [Plate No. 10], except that the carving of the Brussels coach was superior, which is probably due to Capt. Francisco Marchi, of Bologna, who designed the whole.

A State Coach on a far more ambitious scale is described in the same work, which was built in Italy, for the marriage of Duke Edward Farnese with Lady Margaret of Tuscany in 1629. The body was lined with crimson velvet and gold thread, and the woodwork covered with silver plates, chased and embossed and perforated, in half relief. It could carry eight persons: four on the seats attached to the doors, and four in the back and front. The roof was supported by eight silver columns, on the roof were eight silver vases, and unicorns' heads and lilies in full relief projected from the roof and ends of the body here and there. The roof was composed of twenty sticks, converging from the edge to the centre, which was crowned with a great rose with silver leaves on the outside, and inside by the armorial bearings of the Princes of Tuscany and Farnese held up by cupids. The curtains of the sides and back of the coach were of crimson velvet, embroidered with silver lilies with gold leaves. At the back and the front of the coach-carriage were statues of unicorns, surrounded by cupids

and wreathed with lilies, grouped round the standards from which the body was suspended; on the tops of the standards were silver vases, with festoons of fruit, and wrought in silver. In the front were also statues of Justice and Mercy, supporting the coachman's seat. The braces suspending the body were of leather, covered with crimson velvet; the wheels and pole were plated with polished silver. The whole was drawn by six horses, with harness and trappings covered with velvet, embroidered with gold and silver thread, and with silver buckles. It is said that twenty-five excellent silversmiths worked at this coach for two years, and used up 25,000 ounces of silver; and that the work was superintended by two master coach-builders, one from Parma and the other from Piacenza.

An embassy was sent in the latter years of his reign by King James II. to Pope Innocent XI. at Rome, headed by Lord Castlemaine. An account was written of all the state and pomp with which he was received in Rome; a copy of this work is at the hall of the Coach and Coach-harness Makers. On Lord Castlemaine's state entry into Rome, January 8th, 1687, a procession was formed of three hundred and thirty coaches. The ambassador had thirteen coaches of his own, in all probability built for him at Rome. Two of these were state coaches, and certainly were Roman. The bodies of these coaches were similar to that of Louis XIV., without glass in the doors or sides. They were hung inside and out with beautifully embroidered cloths, the one coach with crimson, the

other with azure blue velvet, and gold and silver work. The roofs were adorned with scroll work and vases gilt; under the roof were curtains with silver fringes, and the ambassador's armorial bearings. The carriage of the principal coach was adorned in front with two large Tritons, of carved wood, gilt all over, that supported a cushion for the coachman between them, and from their shoulders the braces depended. The footboard was formed by a conch shell, between two dolphins. In the rear of the coach were two more Tritons, supporting not only the leather braces of the coach, but two other statues of Neptune and Cybele, who in turn held a royal crown. Below Neptune and Cybele, and projecting backwards, were a lion and a unicorn, and several cupids and wreaths of flowers. The wheels had moulded rims, and the spokes were hidden by curving foliage carving. The second coach had plainer wheels and fewer statues about it. In both, the size of the wheels were, as well as I can judge, 2 ft. 6 in. and 4 ft. high, and the length apart 12 ft. The whole appearance of these coaches may have been magnificent, but certainly not beautiful.*

There are a few records of a magnificent state coach that was built in 1713 for the Duke of Ossuna, ambassador from Philip V. of Spain on the occasion of making the peace of Utrecht. The body was in shape somewhat similar to Lord Darnley's chariot at the South Kensington Museum, with the doorway projecting downwards some ten inches below the bottom sides, the quarters rake towards the roof considerably,

* Plate 26 shows a Roman Coach.

the roof over the doorway is arched upwards, the upper quarters are fitted with large glasses of mirror plate-glass. It is elaborately and beautifully carved with figures of Tritons and Nymphs, cupids and lions. The wheels have carved spokes and felloes. It is hung upon leather braces from the usual standard posts, which are carved into figures of men and women, and the supports into figures of boys and baskets of fruit. There is a hammer-cloth cushion in front, and a footboard supported by Tritons blowing horns. The description of this coach was published at Amsterdam.

There is at Madrid a very old coach of a similar shape to this, with many small points so similar as, I think, clearly to mark it out as belonging to the same period. The standards both in front and behind of the Spanish coach are, however, of beautifully wrought scroll ironwork. The body and wheels are of carved wood stained black, the whole of the panels and framing are worked over with very elegant carving, the centre of each panel is a medallion containing figures of females of beautiful forms. There is a photograph of this at Coachmakers' Hall. It is, however, ascribed erroneously to the time of Jeanne La Folle, as Queen Joanna, the mother of Charles V., died in 1555. It is certain that the Spanish tradition of its age is incorrect. The wheels have the spokes turned in spiral form, the rims of the wheels are moulded and carved. The windows, eight in number, I am informed, have been refitted with wooden frames. This coach is deserving of careful study; it is certainly in many points what a

State Coach should be. There are no fittings for servants or driver. It was the custom for many years in Spain to drive postillion, because a coachman of the Duke of Olivarez having overheard and betrayed a state secret, the duke ordered that coachmen should no longer be allowed in Spain.

Our excellent ambassador at Madrid, who takes a great interest in antiquarian researches, has kindly sent me the particulars respecting this Spanish coach, and obtained from the king's librarian the further information that it is not mentioned in any inventory of the royal goods until the early part of the eighteenth century; the librarian's opinion is that the coach belonged to Charles II. of Spain, who died in 1700, and left his kingdom to Philip V., the grandson of Louis IV., King of France. The coach in shape so closely resembles the coaches of 1700 [Plate 17], that there is no doubt it belonged either to Charles II. or Philip V., Kings of Spain.

One of the most beautiful of State Coaches is that belonging to the Imperial family at Vienna. There are photographs of it in Coachmakers' Hall, but to be perfectly appreciated it should be seen. The proportions are almost perfect, and the finish of the mouldings and carvings is exquisite. It was built in 1696, and is shaped with all the curves that are familiar to us in cabinets and furniture of the style called Louis Quatorze, and in which a straight line is so carefully avoided. The body is very deep, and longer on the roof than at the elbows; the doorway is depressed to hide the steps. The panels are beautifully painted

with nymphs in the style of Rubens; indeed, one is told at Vienna that Rubens painted them himself, but that is another instance of the inaccuracy of many local traditions, as Rubens died in 1640. There is an unusual quantity of plate-glass in the panels of the coach, that help to give it a light and airy appearance. The centre of the roof has a large Imperial crown, and large tassels hang from the four corners of the roof, where modern Coachbuilders would place lamps. The body hangs very low. The carriage has a single perch with double cranes, corresponding very closely with those on Lord Darnley's chariot at South Kensington. The standards in the front and hind parts are lofty, elegantly shaped and carved, and strengthened with boldly curved iron stays. The body is hung upon eight leather braces, four of which are arranged on the Berlin plan, and four are attached to short elbow springs beneath the bottom of the body. There are six of these little steel springs at each corner. The wheels are about 3 ft. and 4 ft. 9 in. high, and are very elegantly formed with carved rims, and the spokes each of a shape, with three curves in it. There are no fittings for coachman or footman. The whole of the wood and ironwork is gilt, the panels only are in the colour of a landscape with figures.

It is a singular thing that there is a second coach of the same shape and date, but with the wheels and other fittings of a plainer description, and all black inside and out, with the Imperial arms in bronze relief on the doors. This black state coach is for funerals.

There were a number of state coaches built about this period for the different courts of Europe;* but without illustrations of each, descriptions would not give much idea of their shapes. The general character of each is that of a rather lumbering body, profusely carved, gilded, and adorned, placed on a very lumbering carriage, on some of which are introduced figures of gods and goddesses or animals, appearing to hold up the heavy body by leather braces.

The last, and probably much the largest of these, is the State Coach of England, built for King George III. It is not known who built it; it was designed by an amateur, who could not be expected, perhaps, to consider so much its usefulness as a certain massive grandeur which he expected to gain from an exaggeration of some of the principal parts, such as the body, the total length, and the hind wheels. This coach, built in 1761, was designed by Sir William Chambers; the length is 24 feet, the height 12 feet, the width 8 feet; the weight is stated as 4 tons. The introduction of the figures of four Tritons, to support the braces, is probably imitated from Lord Castlemaine's coach of 1687, but it would have been better to have introduced such figures as leaning against the standard-posts, than to make the figures themselves the bearers. Why the coach was not hung upon C springs, or rather whip springs, it is very difficult to say, as they were in common use in 1760.

* There are several wonderful specimens at Lisbon, Photographs of which are in the writer's possession.

The City State Coach was built in 1757, about the same time as the royal coach. It is, in some respects, in better taste and proportions, but is very unwieldy still. It deserves some study, recollecting in how many city shows it has borne a conspicuous place. The body is the Louis Quatorze shape. The panels would look better if they were repainted; fresh colours would lighten the whole coach. It is to be regretted that the name of the builder is not on record at Guildhall. But, in the same year, a state coach was supplied to Sir Charles Asgill by Messrs Runciman and Barker for £860; it was refitted the following year for Sir Richard Glyn, and successively for Sir Thomas Chitty, Sir Matthew Blakiston, Sir Samuel Fludyer, and lastly for Mr William Beckford. It was, probably, from the original cost, only a second coach, and appears to have been newly painted and otherwise adorned for each successive Lord Mayor.

If the present City State Coach is to be kept for state use it should be supplied with springs. The city coachmaker, who has for some time had the charge of this coach, could add springs without any difficulty, and without much expense.

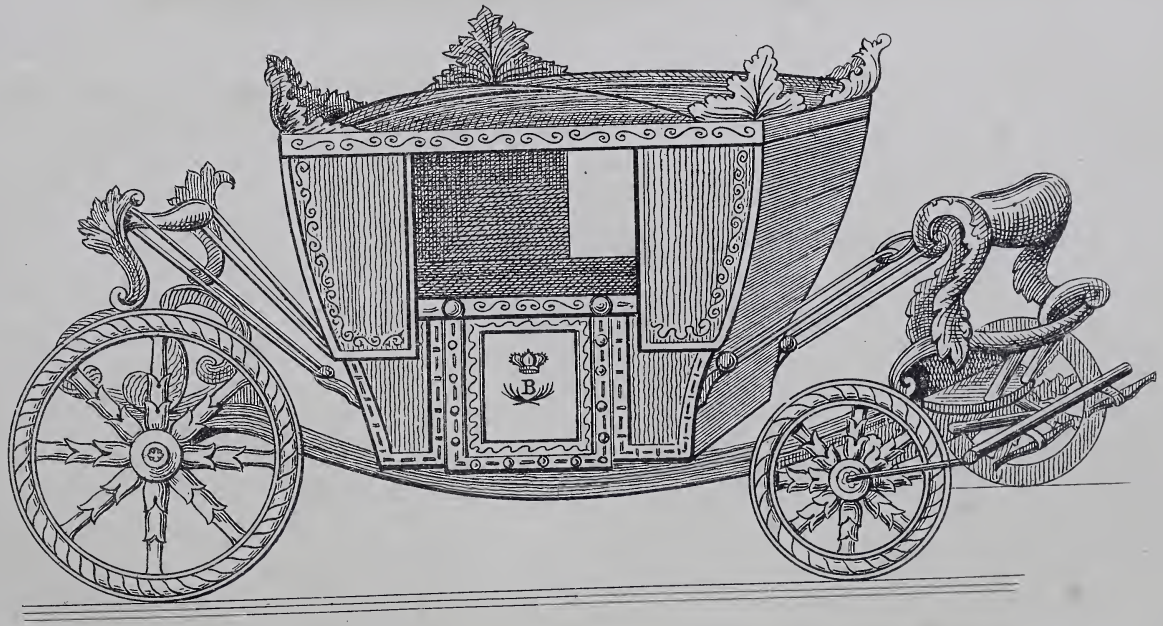


PLATE 26. FROM A PRINT PUBLISHED AT RUME 1692.

CHAPTER IV.

CARRIAGES FROM 1790 TO 1876.

Mr Felton's Opinions—Proper Strength of Carriages—Method of Construction—Usual Width of Coaches—The Perch—Great Height of Wheels in 1790—The Lord Chancellor's Coach—The Landau—Phaetons of 1790—Two Wheeled Vehicles—Taxation on Carriages—Advance of the Trade—Invention of Elliptical Springs—Carriages of Napoleon Buonaparte—Number of Vehicles Paying Taxes—The Curricle. Introduction of Undersprings—Mr S. Hobson's Improvements—The Briska and the Stanhope—The Tilbury and Dog-Cart—Commercial Travellers' Gigs—Travelling Carriages—The Pony Phaeton and the Droitska—The Cab Phaeton and the Victoria—Dress Carriages—Coronation Procession in 1838—Improvement of the Landau—Introduction of the Brougham—Waggonnettes—Exhibitions of Carriages—Numbers of Carriages in 1874.

"IN the year 1790," according to a very competent judge, a coachbuilder then alive, Mr Felton, "the art of Coachbuilding had been in a gradual state of improvement for half a century past, and had now arrived to a very high degree of perfection, with respect both to the beauty, strength, and elegance of our English carriages." "The superior excellence, too, of English workmanship has not only been the occasion of a very great increase in their number in this country, but the exportation of them to foreign nations is become a profitable and considerable branch of British commerce."

These statements might have been made again and again for many years after this date. Our carriages,

as I will endeavour to show, have continued to improve ; but no longer, I regret to have to say, are they exported in large numbers. The cost has so much increased, from the date of 1790, that foreign nations prefer to deal with manufacturers who can give them a vehicle which, to the eye, appears as good as our own, and in colours and finish is more to their taste, whilst the price is from 10 to 30 per cent. less than the British carriage.

Although I shall have occasion to treat this part of our subject in the last lecture more fully, I will here guard against misconception, by pointing out the example set us by our energetic brothers in the United States, who have secured a very large market for their carriages, even in English colonies, by building good and light vehicles at a moderate price. In confirmation of the statement of Mr Felton in 1790, we find that English carriages had been exported to the North American and West Indian Colonies as early as 1740.

To return to Mr Felton's work. He states that the Coach trade was prosperous, and was not confined to Coachbuilders proper, but that harnessmakers and others opened repositories for the sale of carriages. This practice was not confined to England,—it was also a French custom, and so much so, that in the French Encyclopædia, Coachmaking is described under the heading of "Sellier" or "Saddler," and even now in some towns on the Continent, one may see "Sellier" painted on the front of a coach-factory, without any other description of the trade.

The principal improvements in carriages in London from 1770 to 1790 were the invention of Mr John Hatchett, of Long-acre, whose taste in building appears to have been prominent, and other Coach-builders generally copied him.

Mr Felton adds that many gentlemen took great pleasure and pride in getting a handsome coach built, and that his treatise was intended to aid them in forming a judgment thereon.

The following remarks are principally taken from Mr Felton's work, as far as regards this period of 1790 :—

"Carriages should always be built adapted to the places for which they are destined, whether for town, country, or the Continent; as a greater stress is laid upon the carriage in drawing over stones than on a smooth road. This makes it absolutely necessary to build stronger for the town than if intended for the country only, owing to the general goodness of our English roads; it is also necessary to build stronger for the Continent than even for the town, as the badness of their roads obliges them to use six horses where we should use two.

"The construction of every carriage should be as light as the nature of the place for which it is destined will allow. It is folly to give unnecessary weight to the horses, as the pleasure of conveyance arises from expedition and ease, which cannot be effected in a cumbersome, heavy carriage.

"A false opinion pervades the minds of many persons, which is, to build strongly, regarding the durability of the carriage in preference to the pre-

servation of the horses. Superior strength is only effected by additions in weight of the materials used.

"In the usual meaning of the word carriage among Coachmakers, it is the lower framework on which the body containing the passengers is fixed or suspended and to which the wheels are attached. Although, speaking generally, all vehicles are called carriages, yet, in speaking technically, the distinction must be observed.

"It is the body, however, which contains the passengers, which varies most in shape and size, and which is most conspicuous to the eye, and from which, therefore, we derive the particular name of each sort of vehicle."

In Coachbuilding, accordingly, the first process is to draw out a side view of the body, and carefully to assimilate the lines and curves to the prevailing fashion of the day. Secondly, to draw out the plan, or view from above, of the bottom and roof dimensions, with the sweep or cant lines downwards, and backwards, and forwards. The body-maker afterwards makes patterns in thin wood of all the different pieces of timber he requires; these are laid upon planks of ash timber, and marked with chalk, and sawn as nearly to the size as possible. The body-maker then proceeds to smooth one side of the pieces of wood and frame them together. It is unnecessary here to give further details of framing the body, it is sufficient to say that the chief timbers are called the bottom sides; upon them all the superstructure is raised, and upon their stability all depends; they are, therefore, of stout timber, and generally strengthened

with iron plates several inches wide, and from a quarter to three-quarters of an inch thick. It is necessary to mention the bottom sides also, because we can hardly describe the shape of a body without mentioning them. The panels are of soft-grained mahogany, which was used in 1790, as well as at the present day in England; although our neighbours in France preferred then, and generally still use walnut and poplar wood for panels. The roof, bottom, and lining boards are of deal. The roof of a coach is covered with a hide of leather stretched on in a wet state.

The widths usual for the inside of bodies in those days was 3 feet 5 inches for two persons, and 4 feet to 4 feet 2 inches, for three persons on each seat. The height of the seat from the floor was 14 inches, and from the roof 3 feet 6 inches to 3 feet 9 inches. These dimensions will serve to show how little we have varied from them to the present day.

The body being planned out and in progress, the carriage underworks were prepared, and Mr Felton's description answers to the description in most particulars of the method of building from that time to this. The axles were common axles, with a single large nut and linch-pin, such as we now use to agricultural carts and street cabs only. There were improved axle-trees, with double nuts at each end of the axle-trees and patent axles, which were not then furnished with the loose collet now used, and mail axles; all these are carefully described, and evidently very closely resembled the axles in use in 1876. The axles were strengthened by wooden additions called

beds, in which the axles were recessed and clipped. The front and hind axle-beds were joined by a long timber called a perch, with wooden side-stays or wings behind. In front the under fore-carriage was joined to the perch by a large iron perch (or king) bolt. To secure a steady bearing for the upper and under carriages in locking round, a circle of iron and wood was added, termed wheel-plate in England, and the fifth wheel in America. Beneath the wheel-plate were the futchels (or fourchils) to support the splinter-bar and pole, or shafts. All these timbers were heavier in 1790 than those used in the following years; the ironwork was lighter and broke very frequently. The iron used by Coachbuilders in those days was decidedly inferior to the iron of 1830. This remark applies chiefly to the smaller pieces of iron. When a large piece of work, such as an axle-tree or a crane was required, it was forged of a number of bars, welded together, and hammered into a tough, secure mass.

The wheels were the distinguishing feature of the carriages of that day, from their great height and light appearance, and demand some consideration from us.

The extreme height of wheels extended to 5 feet 8 inches, which were made with but fourteen spokes; wheels 5 feet 4 inches high had twelve spokes; wheels 4 feet 6 inches had ten spokes; and the lowest wheels, 3 feet 2 inches high, eight spokes. The naves were of elm, the spokes of oak, and the rims or felloes of ash or beech. The rims of the higher wheels were often of bent timber, in two or more pieces, and were bolted to the tyres by one bolt

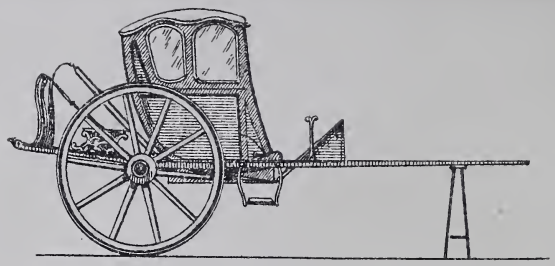


PLATE 25. A FRENCH CHAISE DE POSTE OF 1760

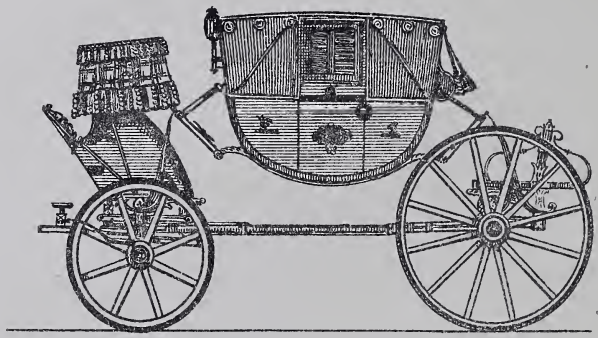


PLATE 27. LANDAU OF 1790

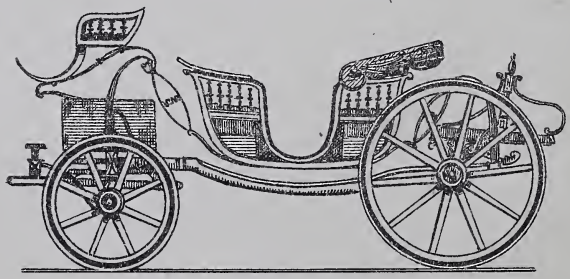


PLATE 28 A PERCH SOCIABLE BY HATCHETT.

between each pair of spokes. The tyre was generally put on in pieces, the end joining in the middle of the felloe. But the better sort of wheels had the tyre put on in one piece, and called, as in the present day, "a hoop-tyre."

"Many persons," Mr Felton says, "prefer the common sort of wheel, on account of their being more easily repaired than the hoop-tyre wheel; but though the repairing the latter is more difficult, they are much less subject to need it." In consequence of the great height of the wheels it was necessary to make the carriages very long, and the distance from the front to the hind axle-tree was 9 feet 2 inches in a chariot, and 9 feet 8 inches in a coach, or about 8 inches in each longer than we should think necessary now. In hackney coaches a shorter perch was customary. Crane-neck perches were still used. The springs were chiefly what is termed the whip spring, namely, an upright spring, slightly curved at the top towards the body. The same spring, if united at the point to another, became a nutcracker or elbow spring. The same united at the thick end with another became the grasshopper, or horizontal spring, and was used for gigs. The C spring was also occasionally used. There was also a small conical spring placed between the double of the braces, after the manner recommended by Mr Thomas to the Academy of Sciences at Paris, in 1703. [*See* Plate 28.]

Having thus described the making of the body and carriage, we naturally proceed to the product. What

was the actual appearance of the coach of 1790? We are again assisted here by the existence of a coach of that period. In the museum of South Kensington may be seen the Lord Chancellor of Ireland's coach, a large body with deep panels, flat-sided, longer on the roof than at the elbow, with windows in the upper quarters; the carriage with two crane perches, (Berlin fashion), whip springs, and very high wheels. There is no hind footboard, whilst a hammer-cloth for the coachman is raised upon scroll ironwork, very well made. The shape and appearance correspond with the designs in Mr Felton's book, and with drawings now in the possession of the well-known firm of Barker and Co., of coaches built by their house for the Duke of Bedford and others during 1780 to 1800.

The chariot was something like the chariot of later days [Plate 38], but was made with smaller windows, deeper panels, a very shallow rocker, and with a sword-case; this was an ugly excrescence at the back of the body, to which there was an opening from behind that squab against which the shoulders rest. The sword-case was at first intended to contain weapons, too frequently required by the many highway robbers that were encountered by travellers, and for fifty years it was considered essential to almost every carriage that was built; but it was a relief to every critical eye when Coachmakers were allowed to omit it.

Landaus were originally invented about the year 1757, at the fortified town of Landau, in Western Germany.

The Landaus in 1790 [Plate 27], were like coaches

in shape but made so as to open in the centre of the roof, the framework of which fell back at an angle of 45 degrees only, to allow the admission of air and the sight of the country more freely than in a coach; but for nearly fifty years there was no improvement in the method of opening and closing the top, technically termed the "hood" of the Landau.

Landaulets were chariots made to open. The hoods of both Landaus and Landaulets, and other carriages, were then made of greasy harness leather, disagreeable to touch or smell, and continually needing oil and blacking rubbed into them to keep them supple and black. This was certainly much against their popularity; but, considering that they were two carriages in one, and would serve for day and night work, and summer and winter, it is not surprising that they found a large amount of patronage.

Besides these vehicles there were phaetons, barouches, sociables, curricles, gigs, and whiskies. Of these phaetons there were several sorts, but all for self-driving by the owners. Young England, in those days especially, delighted in very lofty phaetons and fast driving. The romantic tales of this age, as well as the biographies, are full of anecdotes of adventures by upsets out of these dangerous machines, and yet of the fearful pleasure there was in driving them.

One was called the "Perch-high Phaeton." [Plate 29]. It was shaped like a curricle, and had a leathern hood. The centre of the body was hung exactly over the front axle-tree, the bottom of the body was 5 ft. from the ground, the front wheels were

4 ft. high, and the hind wheels 5 ft. 8 in. The hind wheels were far behind, as we see them in a horse-dealer's skeleton brake. There was a large platform board over the hind axle-tree, for servants or luggage. On such a carriage George IV., when Prince of Wales, used to drive to the race-course, or round Hyde Park. It was on such a carriage that the Hon. Col. Onslow, generally called "Tommy Onslow," performed his feats of driving:

> "What can Tommy Onslow do?
> He can drive a chaise and two;
> What can Tommy Onslow more?
> Oh, he drives a chaise and four."

Another sort of phaeton, with the wheels 6 in. or 8 in. lower, and the body slung between the wheels, was used both for driving and posting. A third sort was used for small horses, with the front wheels 3 ft. 2 in. and the hind wheels 4 ft. 9 in.

Then there was a one-horse phaeton [Plate 30], the body of which was over the hind axle, and it was hung on grasshopper springs, bolted to the axle, and connected with the body by scroll-irons; the body was joined to the fore carriage, which was without springs, by wooden stays, and the wheels locked round in front of the body. This distance of the horse from the driver, though it gives but an indifferent command of his head, yet secures the passengers from the danger of his heels.

The sociable in those days was [Plate 28], in the shape of a double-cab body, made with or without doors, and with or without a driving seat. Sometimes

farmers used a similarly cheap cart without springs, and, to obtain some slight ease, had the seat slung upon straps fastened to the side of the cart. The tax upon four-wheeled carriages was £8 16s. for the first, and £9 18s. for the second carriage, but if three or more carriages were kept, the owner had to pay a tax of £11 on each carriage.

It is difficult for a government who must raise money to so adjust the taxes as not to impede at the same time the industry of the country. Looking back now at the alterations which took place from time to time in the taxes upon carriages used and carriages hired, we can have no hesitation in saying that sufficient attention has never been given to the remonstrances of Coachbuilders and hackney carriage owners at the offices of the Inland Revenue, and that consequently the owners and users of carriages have suffered an amount of annoyance that might and should have been avoided; whilst the amount raised in taxes might have been higher if it had been more judiciously apportioned.

I have now given a description of the principal vehicles at this period of the history of English coach-building. I wish to add that most, if not all, were used for travelling purposes as well as for driving in the cities. By an ingenious arrangement the hammer-cloths could be removed, and the cushions on which the footmen stood behind the coach or chariot gave place to a trunk or rumble. Boxes fitted to the shape, and called imperials, were put upon the roofs. Drag-shoes and chains, tool-budgets and dragstaffs were added,



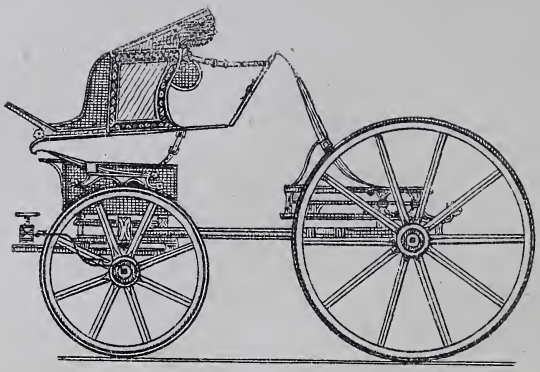


PLATE 29. A HIGH PERCH PHAETON OF 1790.

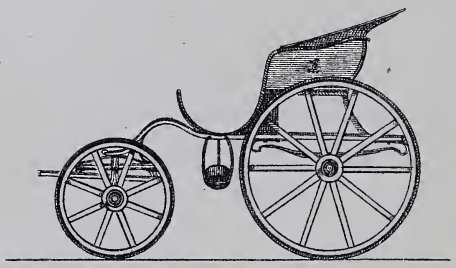


PLATE 30. A ONE HORSE PHAETON OF 1790.

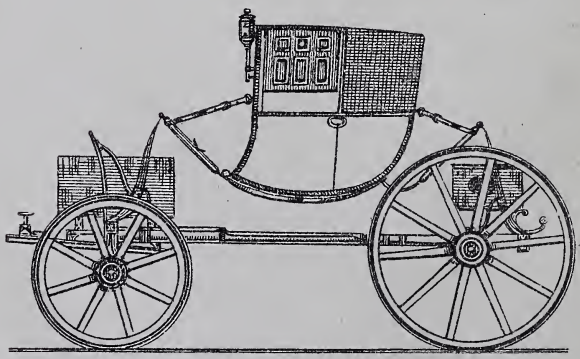


PLATE 38. AN ENGLISH POST CHAISE OF 1790.

and the vehicles could then be used as a comfortable travelling carriage [Plate 38]. The curricles and phaetons were all used to carry trunks, and these are described by Mr Felton very minutely, so as to make it clear we have not much improved upon the fittings of a travelling carriage since 1790.

Looking once more at the history I have given of the state of the coach-trade in 1790, it is impossible not to be surprised at the considerable advance from the clumsy vehicles of Queen Anne and George I.'s time. But during the reigns of George II. and George III., all our manufactures had received an immense impulse from the energy of the men of the time. Discoveries were continually being made in arts and manufactures. Books were written, experiments tried, and debates held in every workshop as to the best mode of construction and arrangements of all the parts, and improvements by the artisans employed became a matter of course. It is true that, with the increased wealth of England there was an increased demand for carriages,—demand will always produce supply,—but all must admit that the supply in those days was very good, and all the varied demands were met with considerable pains and ingenuity.

In the year 1769, the Society of Arts had given sixty guineas to Mr T. Hunt for improvements in tyring wheels, and twenty guineas to Mr Joseph Jacob, of St. Mary-axe, for improved coach springs. This same Mr Jacob wrote a clever treatise on carriages in 1773; and in 1777 he repaired the city state coach. In 1772, the Society of Arts gave twenty guineas to Mr

W. Bailey, for improvements in the locking of waggons; and in 1773, the Society of Arts had experiments made in the draught of carriages, and rewarded a Mr Cuthbert Clarke with fifteen guineas, for an essay on the height of wheels. Later, Dr Edgeworth, in 1816, conducted a series of interesting experiments at Dublin, with a view to ascertain the difference that high and low wheels, long and short carriages, and springs placed between the axles and the vehicles, would have upon the draught of the vehicles.

In the year 1804, Mr Obadiah Elliot, a coachmaker of Lambeth, patented his plan for hanging vehicles upon elliptical springs, thus dispensing with the heavy combined wood and iron perch and cross beds that had been invariably used in four-wheeled carriages up to that time, with the exception of a few one-horse phaetons. Elliot was rewarded by the grant of a gold medal from the Society of Arts, and extensive orders for his carriages from the public, who appreciated his important enterprise and invention.

I have a print, published by Ackermann in 1816, which shows a landaulet upon elliptical springs. There is a square boot, framed to the body, with the driving-seat on ironwork high above the boot; what are usually called the pump-handles behind are straight, and support a foot-board. The whole is upon four elliptical springs, 3 ft. 6 in. long, and with a span of 10 in. The wheels are 3 ft. 8 in. and 4 ft. 8 in. high. The body is very small, and the bottom is 3 ft 6 in. above the ground. But the centres of the axle-trees are only 6 ft. 6 in. apart.

In the same book of drawings there is a full-bodied barouche, only 5 ft. long, hung likewise high, with high wheels, and a very short carriage, with whip springs; a coach and a landau, all painted yellow, are likewise with very small bodies, and are hung high, with short carriages, and the perches nearly straight; also a mail phaeton, with a curricle-shaped body, and a rumble boot framed to it, hung upon a carriage with 3 ft. 4 in. centres, the wheels 3 ft. and 4 ft. 4 in. high, with full-shaped C springs behind, and elbow-springs and braces from a high scroll iron on the transom bed.

It is interesting to observe how the demand for light vehicles had begun to work, in decreasing the size and length in every way, and also in lowering the height of the wheels from Felton's time. Exactly the same revolution was taking place in mail coaches. The improvements carried out in England were repeated on the continent.

In 1810 three beautiful carriages were built at Milan on the occasion of the wedding of the Emperor of Napoleon Buonaparte with the Princess Maria Louisa of Austria. These carriages are still preserved at Vienna, and consist of a state coach, a chariot, and a barouche, all upon C springs. The perches are double, Berlin fashion, with elegant cranes at each end; each perch is octagon, very well shaped, and forged out of solid iron from end to end. All three carriages are small, light, and well finished. The coach has a large crown on the roof and windows in the sides, the hammer-cloth is supported on scroll ironwork, all

the decorations are in a good state and well-proportioned. At the Court of Spain are preserved two handsome coaches built for Charles IV. before 1800, with side windows, an elegant metal fretwork standing above the edge of the roof, hammer-cloths on scroll ironwork and C springs. They have iron crane Berlin perches, and are suspended upon long thick leather braces passing from the hind C springs to the front under the body without any iron loops. Photographs of these vehicles are preserved at the hall of the Coachbuilders' Company.

I have mentioned the designs in the Carriage Fashion Book of 1816. In further illustration I can say that, in 1812, a large coachbuilder's stock-book, which I have seen, contained over two hundred carriages, mostly let for terms of years. Of these one-half were chariots, fifty were landaus, and the remaining fifty coaches and landaulets.

In 1814, there were 23,400 four-wheel vehicles paying duty to Government; 27,300 two-wheel, and 18,500 tax-carts; a total of 69,200 carriages in Great Britain. We shall see by later returns how much these numbers have increased, by the reduction of government duties, and the introduction of elliptical springs.

A carriage was much in fashion at this period called the Curricle; it had been in use for many years in Italy; it was derived, I believe, from the British *essedum*, which had been adopted by the Romans. The Italians of the middle ages brought the body forward in front of the wheels, and at length suspended the body from braces; the French added springs, and the English

altered the shape giving the back panel an ogee curve, and improved the hood, and now added a spring bar across the horses' backs, rendering it a graceful and easy vehicle, which could be driven at great speed. The want of perfect safety checked its early popularity, and it was gradually superseded by the gentleman's cabriolet with one horse, and the mail-phaeton with two horses. It was in use from 1700 to 1830. The celebrated Romeo Coates drove a curricle in the shape of a shell. Charles Dickens drove one as soon as his writings procured him the means, and Count D'Orsay and Lord Chesterfield had new curricles from Messrs Barker's as lately as 1836.

The Coachbuilders of London of the greatest celebrity in 1815 were the large firm of Collinridge, Rowley, Mansell, and Cook, of Liquorpond Street; Windus, in Bishopgate Street, in the city of London; Barker, of Chandos Street; Hatchett, of Long Acre, Houlditch and Hankins; and Luke Hopkinson of Holborn. In 1818 Mr Windus introduced Under-springs to perch carriages. It was found that in bad roads the elliptical springs did not give sufficient ease, but the addition of horizontal springs below the C springs had the advantage of rendering the carriages not only easier but more durable, by relieving the perch and beds from the direct concussions caused by ruts and holes. About the same time concealed hinges were invented. Collinge's patent axles, which had first been made in 1792, became more generally used; their high price had been much against them, but the advantage of carrying a supply of oil for two

or three months, avoiding also the noise and rattle of the common axles (which require fresh greasing daily), gradually secured their use, and when the patent expired they were universally adopted. Now this patent axle and the mail axle are in general use throughout the civilised world.

In 1820 the greatest improvements in the shape and style in the manufacture and finish of English carriages were commenced by the celebrated Samuel Hobson, who may be truly said to have improved and remodelled every sort of carriage which came under his notice, especially as regards the artistic form and construction, both of body and carriage. He lowered the wheels of coaches and chariots to 3 ft. 3 in. in front and 4 ft. 5 in. behind, and lengthened the carriage part once more to such a true proportion to the whole vehicle as has approved itself as correct to each succeeding generation of Coachbuilders and users of carriages. He lowered the body so that it could be entered by a moderate double step instead of the three-fold ladder previously in use. He perfected the curves of the bodies and the springs, besides making the numberless small details of the body and underworks of the requisite strength, and the most agreeable shape and proportion. Mr Samuel Hobson learnt the art in the firm of Barker and Co., of Chandos Street, and rose to be a partner in the firm, but after a few years in that position he left about the year 1815 and set up for himself in Long Acre, and ultimately moved about 1824 to the large premises previously Messrs Hatchett's. In his improvements he was assisted by

his experience gathered at Messrs Barker's, and aided by the enlightened minds and good sense of most of the trade, who copied him as they had copied his predecessor, Mr Hatchett, in 1780.

The Briska, or britchka, had been, about 1818, introduced into England by Mr T. G. Adams, from Austria. [Plate 33.] It was built both upon elliptical springs and C springs, and was made in various sizes, large for family use, smaller for posting, with a rumble behind, and still smaller to be drawn by one horse. This briska was nearly straight along the bottom, according to the fashion of the wicker waggons still so much used in Germany. The hind panel was ogee-shaped, the front terminated in a square boot, and the door was lower than the hind quarter, and was fitted with a solid folding apron or knee-flap. The carriage was short, and the front wheel rather lower than usual. The Briska came, in 1824, to be very much used, and lasted in favour until about 1840.

Two-wheeled carriages had much increased. The Dennett, invented by Mr Bennett, of Finsbury, was a great improvement on the whisky, or gig, of 1790. It was like those, hung upon two long horizontal springs.

The Stanhope was built under the superintendence of the Hon. Fitzroy Stanhope, brother of Lord Petersham, by Tilbury, the builder also of the easy vehicle of that name. The Stanhope was shaped like the old rib gig, but hung upon four springs, two of which were bolted between the shafts and axle, and the other two crossways, parallel to the axle at either end of the body, and shackled to the side springs. These Stan-

hopes are very easy, and do not rock so much as other gigs behind a rough-trotting horse, but they are heavier than the dennett, as it is necessary to add iron plates all round the shafts.

The Tilbury was made without any boot, but otherwise the body was shaped like a stanhope; the shafts were equally strong and plated with iron. It was hung in front by two elbow-springs and leather braces to the shafts or front cross bar, and behind by two elbow-springs passing from beneath the seat to a cross-spring raised to the level of the back rail of the body by three straight irons from the hind part of the cross bar. Later two more springs were added between the axle-tree and the shafts by scroll irons. The Tilbury was an elegant carriage, and when well made, a particularly good vehicle, but the weight of so many springs and so much ironwork gradually took away the public favour; they lasted until nearly 1850. They were perhaps more in favour for export to Italy, Portugal, and other foreign countries, than our other two-wheel carriages, because they would hold together over the roughest roads, and lasted a long time without repair.

The Dog-cart and Tandem-cart belong also to the beginning of the present century in their origin. Dr Edgeworth speaks with horror of the reckless height to which they attained in 1817. "Carriages," he says, "have arisen to a preposterous elevation. That private phaetons and barouches should be mounted out of the town dust, and above the country hedges, is a dangerous luxury, but it does not materially affect the

public. The invention of that daring vehicle, 'the Suicide,' will not probably be much imitated among Christian people; and fortunately the laws have limited the elevation to which, by the absurdity of coachmen, mail coaches might have been raised." The "Suicide" was the name of a very high tandem gig, wherein the groom was mounted upon a seat three feet above the driver. It received its name in Ireland.

The first Dog-carts had a large and deep boot with Venetian slats in the sides, to contain greyhounds or pointers, and the four passengers sat back to back. Tandem-carts were made in a similar manner with a large boot, the driver's seat raised, something like the Salisbury boot fashion, whilst the groom's seat was, like the hind seat of a drag, raised from the boot on ironwork. The gradual development of the Dog-cart in all its varied shapes of high cart and low cart, Newport, Pagnell, Malvern cart, Whitechapel, sliding body cart, Norwich cart, &c., are too well known to need enlarging upon. They have afforded facilities of agreeable locomotion to millions at a very moderate cost, and, if carefully driven, are as reasonably safe as any vehicle. Who drives faster than a butcher boy, and over roads of all sorts—dry, rough, slippery, or newly made—the horse's head held with a snaffle-bit only—and yet it is very seldom that the horse falls.

With the growth of our trade and manufactures the system arose of sending commercial travellers throughout England, to call the attention of shopkeepers to novelties in manufactured goods. It was found advantageous to send these travellers in light vehicles

which could convey samples of the manufactures, and this custom led to the multiplication of gigs in far greater quantities than would have been otherwise required. About 1830 one coach factory in London supplied several hundreds of these vehicles to commercial travellers at annual rentals. Now, this sort of travelling to show samples and solicit orders is performed by railway, and the greatest number of two-wheeled vehicles belong to farmers.

In 1810 a duty was levied by Government upon carriages for sale. It was repealed in 1825, but the returns give the number of vehicles built for private use in 1814 as 3636, and in 1824 as 5143, whilst the number of carriages in use in 1824 had grown to nearly 29,000 four-wheeled, and 36,000 two-wheeled, besides 15,000 tax-carts, a total increase, since 1814, of 20,000 vehicles.

Travelling carriages had now become very much in demand, and were taken on the Continent. Some noblemen and gentlemen began to travel abroad every year. The fittings had become more elaborate. It was usual to cord the C springs from the top to the bottom to strengthen them, and provide against the jolts of very bad roads ; so that, if one or two of the steel plates broke, the cording would still hold all together. Also long ropes were provided, extending beneath the body from the front to the hind springs, to support it should the body-loops give way under the quantity of luggage stowed in boxes, and imperials, and cap-cases. A dragstaff was provided to prevent the coach sliding back when the horses rested in going up hill, and two

drag-chains and shoes against going down hill. Notwithstanding these precautions it became usual, at the top of the Alpine passes, from the courier who attended the traveller to procure from the post-houses two sabots or logs of wood hollowed out to fit a wheel, and these were substituted for the iron shoes during the long and steep descent of the Alpine mountains.

In 1824 a carriage was introduced which has become of almost universal use—the Pony phaeton. In that year King George IV. desired a low phaeton, and one was built for him of a shape and size in which there has been little alteration during the fifty years that have since passed away. It was a cab shape, half caned, with a skeleton bottom side, hung upon four elliptical springs, with crane ironwork back and front, two elbow-wings, bow-steps, and large dasher, and it was drawn by two ponies; the wheels were only 21 and 33 in. high.

Another carriage had been introduced from Germany, called a Droitska, an open carriage with a hood, on a perch, and with C springs. The peculiarity was that the body hung very near the perch; the place for the legs was on either side of the perch, so that the seat was only 12 in. above the hind axle-tree; the chief merit of the Droitska consisted in its lightness compared with Briskas and Barouches, and the shortness of the whole vehicle. In appearance it resembled a *pilentum*, and it is probable that Mr David Davies took his idea of a *pilentum* from the shape of the Droitska. Mr David Davies, a Coachmaker of Albany

Street, and afterwards of Wigmore Street, had considerable inventive faculties. He originated a number of vehicles, the Pilentum phaeton, about 1834, which was an open carriage with the doorway very near the ground, the driving seat was also low, the whole hung upon elliptical springs, and built of different sizes, to carry four or six persons, and adapted for one or two horses.

The invention of the Cab Phaeton is also attributed to him; this was a cab-shaped body suspended on four elliptic springs, with a low driving seat and dasher, and shafts for one horse. It was soon generally adopted, and became the pleasure carriage of thousands. The cab phaeton was dispersed throughout England, and also on the Continent, where it became known under the name of "Milord." About 1850 it had become the hack carriage of several of the Continental cities, and so went out of fashion with the gentry. During the last few years, however, it has been revived under the name of Victoria. In 1869, I think it was, that the Prince of Wales bought one at Paris of the curved shape, and Baron Rothschild brought another from Vienna of the square shape, and the Victoria became again the popular carriage. Light, low, easy, fit for one horse, and looking very well behind a pair of cobs, it is not surprising that the Victoria meets with so much patronage, and it is pleasant to observe how little difference there is made by different Coachmakers in the size and shape of this useful and elegant vehicle. I have had occasion to notice the influence that certain Coachbuilders have had upon the progress of this art, and

it will not be right to omit to mention the great influence that Messrs Peters have exercised upon the whole trade by the sound and good workmanship which has for so many years characterised their establishment. As early as 1836 their Mail phaetons were noted for the steadiness with which they followed the horses, and the firmness with which they encountered rough roads.

The year 1838 claims special notice in the annals of Coachbuilding; it was probably the climax of the efforts of modern Coachbuilders in what is called "Dress" or "State carriages."* These vehicles had long passed the period in which beautiful carving and elegant painting had been used to disguise, as far as possible, the clumsy State carriages of the 18th century. Ever since the building of the Irish Lord Chancellor's State coach by Hatchett or Baxter in 1790, Coachbuilders had endeavoured to produce a graceful outline of body, of a fair size no larger than was necessary, the C springs had been made of a perfect curve, the perch followed the sweeps of the body, the carving was reduced to a moderate amount, the ornamental painting was confined to the stripes upon the wheels, and the heraldic bearings of the owners of the carriages were beautifully emblazoned on the panels. For further ornament they relied upon plated work in brass or silver round the body and on the loops and wheel hoops. In every capital

* An analysis of the sale of Messrs Cook and Rowley's stock in 1830, and Messrs Hobson's stock in 1838, shows the proportions of 70 chariots, 60 coaches and landaus, 32 barouches and briskas, 12 cabs, 6 mail phaetons. Total, 180.

of Europe such carriages had superseded the old style, and London and Paris had supplied other countries with most of these State carriages. In this year, 1838, was the coronation of our gracious Queen, and the different ambassadors of foreign countries and our own nobility had prepared for the occasion a larger number of court Dress carriages than had ever been hitherto seen in London. Of these vehicles it was generally considered that Marshal Soult, the French Ambassador's coach bore away the palm. Engravings of some of the best were soon published. Marshal Soult's coach was built by Mr Dalringen, at Paris. The body had four upper quarter glasses, with a very elegant deep and pierced cornice of silver round the roof, there were four lamps with large coronets on the tops, and the coach bore a coronet on the roof also. The colour of the painting was a lovely blue, such as was then called Adelaide blue; this had been varnished with white spirit varnish, and seemed almost transparent in lustre. The whole coach was ornamented with silver and was finished in great taste.

About this period a noted Coachmaker named Luke Hopkinson, of Holborn, introduced the briska landau. The peculiar shape is now of little consequence, but with this carriage commenced those improvements upon landaus which have since rendered them so popular.

Up to this time the Landau head had opened just as it did in 1790, and no more; the pillars which now lie nearly flat fell usually only at an angle of forty-five

degrees. Mr Hopkinson cut away the corners of the back rails, which hindered the hoopsticks from lying on the elbows, took away the heavy squabbing that bulged into the body when the head was lowered, and lined the upper quarters with plain cloth only, as in a briska head. He also made the seats and bottom to rise six inches when the landau was open, to give the persons inside more air and freedom.

To Mr Laurie we must give the high credit of improving upon Mr Hopkinson's improvements, and persisting in seeing that his workpeople kept on improving, instead of, as workpeople used to do in 1838, hinder their employers by vexatious objections to all alterations.

This period was noted also by the patronage by the Duke of Wellington of a vehicle called the equirotal, invented by Mr W. Bridges Adams. This was a gig without a head, and a curricle with a head, made so that each could be used with one or a pair of horses, or combined into a mail phaeton by adding two couplings between the two bodies; the four-wheels being of equal height, give it the name of equirotal. The invention has some very good points, and may be revived some day, with a more perfect connecting joint than Mr Adams attained in 1838.

But the greatest improvement of this period was the introduction of the brougham. Lord Brougham and others had for some time used a one-horse chariot. The Pilentum chariot for one horse had already been built at Paris, and several other small close carriages called Clarences had been constructed ;

but none of these, although some were really light enough for one horse, took thoroughly the taste of the public. Mr David Davies introduced some shapes, and Messrs Laurie and Marner perfected them. I think it was in 1839 that the first vehicle which was nearly the shape of the present Brougham, was built by Mr Robinson, of Mount Street, for Lord Brougham. Messrs Thrupp built one in the following year, 1840, of the same shape. In a few years they were built by nearly all Coachmakers, and proved so convenient that they superseded even the cabriolet for gentlemen's use. The size of the first Brougham was much as is now in vogue, about 4 feet long in the body, and the same breadth outside measure, the wheels 2 feet 11 inches and 3 feet 7 inches, the driving-boot was made without any arch, in a single sweep from the body to the foot-board; it was hung on elliptic springs in front, and five springs behind, without any body steps. This was preceded by the pill-box Brougham, as it was called, with straight front pillars, and the body very much contracted in front, to look light. A street cab was the forerunner of both.

In a year or two, Mr Edward Lytton Bulwer (afterwards Lord Lytton) had a small Clarence of the shape called Imperial Clarence which was painted brown with white wheels, and had a small hammer-cloth of brown and white; the whole was tastily fitted up and finished, but the attempt to introduce a miniature chariot did not succeed, although it was built with considerable care by Messrs Laurie and Marner.

In 1845, Waggonettes were built of some size; the first, it is said, was made under the superintendence of the late Prince Consort, and was successful as being the forerunner of a very large number of light, roomy, and useful vehicles. Break waggonettes are also an improvement upon the uncomfortable conveyances called Breaks in early days. The principle of riding sideways was not new. The Irish car, the four-wheeled Inside-car of the Westmoreland Lake district, the old Break, and the Omnibus all contributed to the design of the modern vehicle.

In the modern Waggonette we have not only a good looking, comfortable carriage, but one which possesses the advantage of carrying a greater number of persons than any other four-wheeled vehicle of the same weight and size.

In 1846 was introduced and perfected by Messrs Hooper the system of suspending carriages on a single wrought iron perch, supported by horizontal undersprings. The perch being light, and to a certain extent elastic, enabled all the beds and iron stays to be proportionately reduced in weight; the wheels and axles, having less to carry, were also made lighter. This system at first was only applied to broughams and sociables, but it has gradually been applied to the largest carriages, especially barouches and landaus, not only in England, but in all countries where carriages are made, so that it is quite the exception for a new carriage to be built with a perch that is not of solid wrought iron. These connecting perches are not now made quite so light as at first; it is found that

unless the hind wheels follow steadily, not only is the carriage heavier behind the horse, but the perch itself is frequently bent against very small obstructions ; a stronger and stiffer perch is therefore now used, and it is found both easier to the horse and to the occupants of the vehicle.

We have now reviewed the principal varieties of carriages introduced into England during the present century ; to enumerate the whole would be tedious. At our great Exhibitions in London, Paris, Vienna, and other cities, new shapes have continually appeared, and some have found favour, and some have appeared no more. They are evidence that the ingenuity of Coachbuilders is not less than the ingenuity of the workmen in other trades. The history of the last twenty-five years is, however, sufficiently fresh upon the memory not to require repetition. We have already in the reports of the juries of those several Exhibitions, drawn up by Mr George Hooper, a record of the most noteworthy objects. It would be for the benefit of all persons engaged in Carriage-building if those reports could be reissued with the addition of a report of the interesting Philadelphia Exhibition now in progress. M. Guiet, of Paris, will probably write a report for use in that city.

In Saint Petersburg the Russian Emperor had an Imperial carriage factory, originally established in 1821. At these works, which now belong to Messrs Brautigam, two hundred and fifty men are employed. Fifty new carriages a year are built for the Royal family, besides the repairing and altering of others.

There is a steam-engine on the premises. There is also at St Petersburg a museum, in which repose travelling carriages on the ground floor, and State carriages on the first floor. There are post-chaises of 1746 and 1762, and seven carriages which were in use by the Empress Catherine, many decorated by well-known painters, such as Watteau, Boucher, Gravelot, &c., and superbly fitted up in the interior with velvet and silk. There are twelve sledges of the elaborate build of former days.

I will here mention that, by the kind permission of Mr W. H. Smith, of the Treasury, I am able to give some further returns of carriages paying duty. Four-wheeled carriages amounted in 1834 to 49,000; in 1844, 62,000; in 1854, 68,000; in 1864, 102,000; and in 1874 there were actually 150,000 four-wheeled carriages paying duty, but these last numbers now include vehicles which were formerly taxed under the Postmaster's and Stage duties, and these vehicles in 1864 had amounted to 25,000, still without them the increase in ten years is 23,000, quite as many as were kept in the year 1814. In 1814, that is 23,000 four-wheeled carriages paid duty, and in 1874 they had increased to 125,000.

The return states there were of two-wheeled carriages in—

1834 . .	50,000	including the tax carts.
1844 . .	33,000	„
1854 . .	137,000	„
1864 . .	170,000	„

And in—

1874 . .	285,000	two-wheeled carriages, including basket and other four-wheeled traps under 4 cwt.

Carriages of both sorts then have increased from about 60,000 in 1814 to 432,600 in 1874, a benefit to the general population it is clear, as well as to the workmen.

It is a satisfaction that our trade contributes to the comfort, happiness, and respectability of the community in general, and is also a very healthy trade for the workmen.

CHAPTER V.

ON PUBLIC CARRIAGES.

Travelling before A.D. 1600—Great Width of Waggon Wheels—Turnpike Roads—Post Saddle Horses—Hackneys—Stage Coaches—Hackney Coaches—Cheap Rate of Hire—The York Coach—The Manchester Flying Coach—The Post Chaise—The Diligence—Post-Boys—Mr T. Pennant on Travelling—Increase of Mail Coaches—M'Adam's Roads—Four-in-Hand Clubs—Russian Travelling—Two-Wheeled Street Cabs—Street Cabs need Improvement—Hansom Cabs—Omnibus of Pascal—Omnibus of 1820—Shillibeer's Omnibuses—General Omnibus Company—American Coachmaking—Fast Cabs of Vienna.

I MENTIONED in an earlier lecture that the Romans, during the time of the Emperors Augustus and Tiberius, established a system of public vehicles for hire. These were stationed at inns or post-houses, at intervals of five or six miles, and there were twenty or more horses kept at each inn along the great main roads of Italy, and many of the dependent countries of Europe and Asia. The chief use of the post-houses was to supply the public messengers, but they were found of such accommodation that more horses and vehicles were required for the use of travellers. The *essedum*, or two-wheeled curricle; the *cisium*, or gig; and the *rhedum*, a four-wheeled waggon, drawn by four or six mules, were the chief carriages kept at these stations.

Cesarius, a magistrate in the time of the Emperor Theodosius, went post from Antioch to Constantinople, six hundred and sixty-five miles, in six days, with a speed, allowing for stoppages, of about six miles an hour.

Coaches, we have already seen, were introduced into England in the sixteenth century, stage coaches in the seventeenth, mail coaches in the eighteenth, and railways in the nineteenth centuries. Each of the four last centuries had added to and improved upon the systems of passenger and commercial transit. The facilities for travelling, prior to the introduction of coaches, were afforded by saddle horses, and by cars or charettes, (vehicles without springs, as I have already described), by waggons, and by strings of pack-horses following each other laden with goods, upon which a passenger occasionally sat. For the sick, and ladies who did not ride, the litter, carried by men on two poles, or strapped to mules or horses, was generally adopted.

Persons were in the habit of collecting together and travelling in company with these conveyances, or in gangs by themselves, or on horses when they had them, for their mutual protection. Old men can still recollect strings of pack horses traversing Lancashire and Yorkshire, and advertisements for companions desired by gentlemen about to ride to London.

Laws for the improvement of old roads and the making of new, were passed in the reign of Henry VIII., and special mention is made of those between St. Clements Danes in the Strand, and Char-

ing Cross, Holborn, and Southwark as being then noxious and very jeopardous. In the time of Queen Mary, in 1555, an Act of Parliament ordered the appointment of two surveyors for each parish, and that the roads should be repaired under their supervision.

Towards the end of the sixteenth century the long broad wheeled waggons were introduced into England, and began to pass regularly between the great towns with goods and passengers. These long waggons first received the name of "Stages." There are continual allusions in old books to their great convenience, although the rate of speed was small.

About one hundred and thirty years ago there seems to have arisen an extraordinary contest between the owners of waggons and those who repaired the highways. It was asserted that the waggon wheels destroyed the road by reason of the great weight of the vehicles and the narrowness of the tyres.

The question was carried before Parliament, and endeavours were made to widen the tyres to nine and even ten inches, so as to reduce the crushing effect of the wheels on soft roads to a minimum. On such roads it was said there were ruts more than a foot deep, cut by the narrow wheels. The Legislature endeavoured to promote the use of broad wheels by exemptions from turnpike tolls, by restrictions and fines upon narrow wheels, and actually recommended tyres 16 inches wide, under the idea that they would roll roads flat, just as gravel walks in a garden are rolled.

In the British Museum is a work by Daniel Bourne, dated 1763, having a design of a waggon with four wheels in which the front axle-tree is very short, so that the track outside the front wheels is made to correspond with the inside of the hind wheels, and they are made like four garden rollers, each 15 inches wide, so that as the waggon moved 5 feet of the road should be simultaneously rolled flat.

After a contest of many years it was generally acknowledged that, to oblige waggoners to carry burdensome wheels to roll the road for pleasure carriages, was an obvious hardship. Every inch added to the really necessary width for strength to the tyre of the wheels was felt by the carrier as a grievance, and the evasion of the government regulations was sympathised with by the common sense of mankind. It was left to the waggoner to keep the wheel sufficiently narrow to run lightly, and sufficiently wide to prevent its sinking with a heavy load into the road. It was admitted that the chief person interested in the matter was the waggoner, as, if his wheels turned heavily over the road by reason of sinking into the surface, then he would fine himself by being obliged to use more horses, or by travelling very slowly.

During the whole of the sixteenth century the improvement of English main and cross-roads continued steadily advancing by the system of turnpike tolls, on the security of which money was borrowed by the parishes in order to make them. Although

for a long time there was great opposition, yet the system suited the time, and was probably, in our free country, the only way to obtain them. In France, on the other hand, the nobility made their roads by the forced labour of the peasants within their territory—one of the instances of cruel oppression that led to the outbreak of the French Revolution of 1786, as the poor peasants were obliged, from time to time, to leave the cultivation of the fields and turn out with carts and horses to labour for two or three weeks together at the repair of the roads, and this, too, without any payment.

In 1617, an author named Fynes Morryson relates, that "there were post horses in England, at stations about ten miles apart, that could be hired by travellers on horseback at the charge of 2½d. per mile to 3d.," but, he adds, "most travellers ride their own horses. In some counties a horse can be hired at 3d. per day, finding the food. Likewise carriers let horses from city to city bargaining that the passengers put up at their inns. They will lend a horse for five or six days thus, and provide its food at these inns for about 20s. Lastly, these carriers have long covered waggons in which they carry passengers to and fro; but this kind of journeying is very tedious; so that none but women and people of inferior condition travel in this sort. Coaches are not to be hired anywhere (this was in 1617) but in London. For a day's journey a coach with two horses is let for about 10s. a day, or 15s. with three horses, the coachman finding the horses' feed."

Yet in 1610 a native of Stralsund, in Pomerania, obtained in Scotland a Royal patent giving him the exclusive privilege of running coaches and waggons between Edinburgh and Leith.

The horses that were hired for travellers were called in France "hacqueneè," and in Wales "hacknai," which term extended into England, and after was applied to hired coaches, thence named Hackney Coaches. Samuel Pepys, in his Diary of 1662, speaks of riding his hacqueneè to Woolwich, at a period when he did not keep any horse of his own.

I have already mentioned that long waggons were the first stages; their use commenced before the year 1600, but for the poorer classes there was no other conveyance for many years, and it was late in the eighteenth century before stage coaches were able to give any accommodation to persons with a small purse.

The Stage Coach began to be used in 1640, the same description of vehicle as that in use for private or hackney work, but of a larger size. The body would hold eight persons at times, but generally only six; the passengers were screened from the weather by leather curtains. It was not until the year 1680 that plate glass was sufficiently cheap to be used for windows. The coachman sat on a bar between the two standard posts from which the body was slung, with his feet upon the footboard fixed to the top of the perch. Behind, between the great wheels, was the basket for luggage, in which the outside passengers also sat up to their knees in straw. The body swung

about upon heavy leather straps through the rough country roads.

In 1649 Chamberlayne, in a work entitled "The Present State of Great Britain," speaks up for coaches. "Besides the excellent arrangement of conveying men and letters on horseback, there is of late such an admirable commodiousness both for men and women, to travel from London to the principal towns in the country, that the like hath not been known in the world; and that is by stage coaches, wherein any one may be transported to any place sheltered from foul weather and foul ways, free from endamaging of one's health and one's body by hard jogging or over-violent motion on horseback; and this not only at the low price of about a shilling for every five miles, but with such velocity and speed in one hour as the foreign post can make but in one day."

In 1662, when there were but six stage coaches, another writer of the day condemned them. "For," he says, "these coaches make country gentlemen come to London on small occasion, which otherwise they would not do but upon urgent necessity; nay, the conveniency of the passage makes their wives often come up, who, rather than make such long journeys on horseback, would stay at home. Here, when they come to town, they must be in the fashion, get fine clothes, go to plays and treats, and by this means get such a habit of idleness and love of pleasure that they are uneasy ever after."

Another writer in 1673 opposes stages. "Is it," he asks, "for a man's health to be laid fast in foul

ways, and forced to wade up to the knees in mire; and afterwards sit in the cold till fresh teams of horses can be procured to drag the coach out of the foul ways? Is it for his health to travel in rotten coaches, and have their tackle, or perch, or axle-tree broken, and then to wait half the day before making good their stage?"

This gives us some idea of the badness of the roads, and the imperfection of the vehicles. These last, however, were not improved in the time of Hogarth, who, in 1730, painted a stage coach waiting in an inn-yard.

In the Diary of Sir William Dugdale we find records of his journeys by stage coaches between 1659 and 1680, to the towns of Norwich, Coventry, Chester, St Albans, Bedford, and Birmingham during the reign of Charles II.

Hackney coaches were first used in England in 1605 [Plates 13, 14, and 22]. These were similar to the coaches used by the gentry; at first they did not ply for hire in the streets, but remained at the hiring-yards until they were wanted. As, however, many more persons wished to hire than could afford to keep a coach of their own, the demand increased rapidly. In 1635 the number was restricted to fifty. Still they increased in spite of the opposition of the court and king, who thought they would break up the roads, till, in 1650, there were as many as three hundred. In Paris they were introduced by Nicholas Sauvage, who lived in a street at the sign of St Fiacre, and from this circumstance hackney

coaches were called in France "Fiacres," and they became very common and popular. In 1772 the hire of fiacres in Paris was a shilling the first hour, and tenpence the second. In London, in 1662 there were four hundred hackney coaches, and the government began then to levy a yearly duty upon them of £5 each. In 1694 the number had increased to seven hundred, a substantial proof of their usefulness. Mr Pepys, in his amusing Diary, continually speaks of hiring coaches for use in London, and to go to Deptford and Woolwich, in his journeys to the dock-yards in his business for the Admiralty.

Many of these were the old coaches of the nobility and gentry, and it is not until 1790 that we hear from Mr Felton that the hackney coaches were generally built of a smaller size, and much shorter in the under carriage than those of the gentry. Their hire appears to have been very moderate, to judge by the records of Dean Swift, who resided in London for three years in the days of Queen Anne (1710 to 1713), and who made frequent use of hackney coaches, and on wet days did not venture out without a coach or a sedan chair. It would seem he could ride from the city to the neighbourhood of St Giles for one or two shillings.

To return to stage coaches, we are told that in 1673 there were coaches from London to York, to Chester, and to Exeter, having each forty horses on the road, and carrying each six inside passengers. The coach occupied eight days in travelling to Exeter, but the fare was only forty shillings in the summer and fine

weather; in winter the same coach was nearly ten days on the road, and the fare was increased to forty-five shillings. There were four-horse stage coaches going daily to places within twenty or thirty miles of London, and others that went to places within ten miles and returned the same day.

In 1703, a stage coach went from London to Portsmouth, when the roads were good, in fourteen hours.

In 1706, a coach went from London to York every Monday, Wednesday, and Friday, which performed the journey in four days, allowing each passenger fourteen pounds of luggage free, and above that weight the charge was threepence per pound.

In 1742 the Oxford stage used to leave London at seven in the morning, reaching High Wycombe at five in the evening, and, resting the night, proceeded to Oxford the next day.

In the same year there was a coach from London to Birmingham, starting on Monday and arriving on Wednesday, forty miles a day, but the coach usually stopped half one day at Oxford.

In 1751, a stage coach went to Dover, arriving at Canterbury the same night, reaching Dover early the next day, and starting on its return to London the same afternoon. The advertisement states that there is a conveniency behind the coach for baggage and outside passengers. This implies that it was not, even at this late date, usual to carry passengers on the roof, and that the general structure of the vehicle was similar to the stage coach of 1640; one change had been made: the driving box on the fast coaches

was placed high above the horses on a narrow boot, something like what is called a Salisbury boot; this was placed upon the beds or timbers of the carriage, with a tolerably comfortable seat for two persons upon it. But the jolting and shaking over rough bits in the road must have been very trying. In the hall of the Coachmakers' Company, in Noble Street, Cheapside, is a picture of Hyde Park Corner in 1796, painted by Dagaty, in which is an old stage coach; the hinder part has a boot and guard's seat attached to the body as in modern stage coaches, but the box is detached from the body and on the beds, as described above; the panels of the body are very deep, and on the upper quarters are painted two large stars, from which we may conjecture that it is a mail coach.*

From the Ipswich Journal, August 1754.

THIS IS TO GIVE NOTICE

"That a handsome Machine, with steel springs for the ease of passengers and the conveniency of the Country, began on Monday, the 8th of July 1754, to set off from Chelmsford every morning at 7 o'clock, Sunday excepted, to the Bull Inn, Leadenhall Street, to be there by 12 o'clock, and to return the same day at 2 o'clock to be at Chelmsford by 7 o'clock in the evening. Fresh horses will be taken at the White Hart at Brentwood and the Green Man at Ilford. To be performed, if God permits, by TYRRELL & HUGHES."

In 1754 a coach was started from Manchester called "the Flying coach." The advertisement states, "however incredible it may appear, this coach will actually arrive in London in four days and a half after leaving Manchester."

* See Plate 34 for a similar stage coach.

The sort of vehicles stage coaches usually were in those days will appear from the following :—

"In 1755 stage coaches are described* as covered with dull black leather, studded, by way of ornament, with broad-headed nails, with oval windows in the quarters, the frames painted red. On the panels were displayed, in large characters, the names of the places whence the coach started and whither it went. The roof rose in a high curve, with an iron rail around it. The coachman and guard sat in front upon a high narrow boot, often garnished with a spreading hammer-cloth with a deep fringe. Behind was an immense basket, supported by iron bars, in which passengers were carried at lower fares. The wheels were painted red. The whole coach was usually drawn by three horses, on the first of which a postillion rode with a cocked hat and a long green and gold coat. The machine groaned and creaked as it went along with every tug the horses gave, and the speed was frequently but four miles an hour."

The first Post-chaise built in England was only on two wheels, and was open in front. This corresponds with the description of the *chaise de poste* of France. In 1765 the stage coaches from Dover to London were drawn by six horses; the fare was a guinea. Servants paid half a guinea, riding either in the basket behind or on the box, which held three persons. In 1775 stage coaches are stated in the Annual Register to carry eight passengers inside and ten outside, and that there were (including vehicles called flys,

* By Sir Walter Scott—preface to a novel.

machines, diligences, and stage coaches) four hundred altogether. In 1779 a licence duty was first levied by government on stage coaches. Increased accommodation was provided by seats on the top. It must have been at this time that the front and hind boots began to be framed to the coach body, or there would have been no rest for the feet of the roof passengers.

In 1798 a stage coach ran from Gosport to London, 86 miles, in 19 hours: $4\frac{1}{2}$ miles per hour. It is not until 1754 that we have a reliable account of any stage coach being upon springs, but in that year, in the newspaper called the *Edinburgh Courant*, appears the following advertisement: — "The Edinburgh Stage Coach, for the better accommodation of passengers, will be altered to a new genteel two-end glass coach machine, being upon steel springs, exceeding light and easy, to go in ten days to London in summer and twelve in winter, every other Tuesday." This coach rested all Sunday at Burrowbridge.

In 1757 a coach was started to run in three days from Liverpool to London; Sheffield and Leeds followed the examples of Manchester and Liverpool, and set up "speedy coaches," so that in 1784 coaches became universal at the speed of eight miles an hour.

In France, we learn from M. Roubo's work, that in 1760 the Diligences (their stage coaches) were constructed much as ours, with large bodies having three small windows on each side and hung by leather braces on long perch carriages, with high hind wheels and low front wheels, without any driving box, and

fitted with large baskets, back and front, for passengers or luggage; they were drawn by five horses, and driven by a postilion on the off wheeler instead of the near wheeler, as in England. One of their Diligences running to Lyons had springs [Plate 35], and it is noted by M. Roubo as the only Diligence in France with springs, and also the most speedy. It performed the journey to Lyons, about three hundred and twenty miles, in five days during the summer and six in winter. Deducting the time allowed for refreshments, changing horses, and resting at night, the speed of the Diligence appears to have been between five and six miles an hour. M. Roubo also describes a large stage coach called a Gondola, holding twelve persons inside, ten sitting sideways and one at each end; this vehicle may be considered as the grandfather of the omnibus, which was first made at Paris. Another coach was called a coupè Berlin, having four doors and three seats, the middle seat corresponding to the third inside seat of the so-called stage coaches used in America at the present time. There was, however, a backboard to lean against, but I believe that in the American stage coach the back of the middle seat is only a wide strap. The other travelling public carriage in France was the "chaise de poste" upon two wheels [Plate 25], which I have already described in a former chapter. I remember to have seen one of these at Amiens thirty years ago painted yellow like so many of the English post-chaises. There are probably many of these vehicles still in France. They are much like our

gentlemen's cabriolets, but larger and heavier, and are drawn by one stout horse in the shafts, with a second horse ridden by the postillion, attached to an out-rigger-bar on one side of the shafts. The chaise de poste was first made in France in 1664.

To return to our own country. Stage coaches had increased so much in speed that in 1780 they were quicker than the post which carried the letters.

For a long time letters had been entrusted to the bags of the post-boys, who travelled on horseback at the rate of about three and a half miles an hour. Mr John Palmer, the originator of mail coaches, in the year 1784 gave the following statement to the Government:—"The Post at present, instead of being the swiftest, is almost the slowest conveyance in the country; and though, from the great improvement in our roads, other carriers have proportionably mended their speed, the post is as slow as ever. Rewards have been frequently offered by the Post-master-General for the best constructed mail-cart, or some plan to prevent the frequent robbery of the mail, but without effect." Palmer, who resided at Bath, went on to state, "that the coach diligence, which left Bath at four o'clock on Monday afternoon, would deliver a letter in London about ten on Tuesday morning, whilst the post would not deliver a letter until Wednesday morning. The only advantage of the post was its greater cheapness. The post charged only fourpence from Bath to London for each letter, whilst one by the coach diligence cost two shillings.

Nevertheless, many persons, both at Bath and Bristol, sent by the dearer and quicker mode, and all over the kingdom, wherever diligences * were established, they obtained the patronage of the public."

At first any improvement on the Post was warmly opposed by the officials and committees of the Houses of Parliament, and it was declared impossible that letters could be brought from Bath to London, only one hundred and eight miles, in eighteen hours, *i.e.*, six miles an hour. After some careful experiments, and a struggle of two years, Mr Palmer's system was adopted, and his new-fashioned mail coaches were accepted to convey the mails. For some years the mail coaches did not run at more than six miles an hour: they were built in a cumbrous form to carry six persons inside. In this same year (1786) the Prince of Wales, afterwards George IV., began to erect the pavilion at Brighton, bringing fashionable company into the mere fishing hamlet which it then was. The effect upon the traffic was very great, and led to the reform of the whole of the south and south-western roads, and in 1820, thirty-five years later, no less than seventy coaches daily visited and left Brighton.

Mr Thomas Pennant, the celebrated antiquarian, writing in 1782, says, "that in March 1739, he travelled to London in a Chester stage, then no despicable vehicle for country gentlemen. The first day, with much labour, we got from Chester to Whitechurch, twenty miles; the second day, to the Welsh Harp; the third, to Coventry; the fourth, to North-

* Here we have the French name of diligence instead of stage coach.

ampton; the fifth, to Dunstable; and, as a wondrous effort, on the last, to London before the commencement of night. The strain and labour of six good horses, sometimes eight, drew us through the sloughs of Mireden, and many other places. We were constantly out two hours before day, and late at night; and in the depth of winter proportionably later."

"Families who travelled in their own carriages contracted with Benson & Co., and were dragged up in the same number of days, by three sets of able horses."

"The single gentlemen, then a hardy race, equipped in jack-boots and trowsers up to their middle, rode post through thick and thin, and, guarded against the mire, defied the frequent stumble and fall; arose and pursued their journey with alacrity; while in these days their enervated posterity sleep away their rapid journies in easy chaises, fitted for the conveyance of the soft inhabitants of Sybaris."

In 1799 His Majesty's mails were paraded in procession past St James's Palace to the General Post-Office, and it is said that the custom was kept up for thirty-six years on the king's birthday. Each coach was new, or turned out to look like new, and was painted red with the Royal arms on the door panel, and on the smaller panel above the name of the town to which the coach went, on the boot the number of the mail, and on each upper quarter one of the stars of the four orders of the knighthood of the United Kingdom, the Garter, the Bath, the Thistle, and St. Patrick. The coaches were built just big enough to

contain four inside and three or four outside, and coachman and guard. The body was hung upon a perch carriage and eight telegraph springs, the underworks being both solid and simple in construction. At first the number was about eighty, but more were added as time went on, until there were at length seven hundred mail coaches in the year 1835. Only a small quantity, however, left London, the rest were dispersed all over Great Britain and Ireland.

These mail coaches were at first built and kept in repair by contract in London. The experience gained by watching these vehicles was very advantageous to the coach trade; anything faulty in timber or iron, steel or paint, was soon discovered by the vigilant contractors and remedied, and their plans and devices spread through the trade to the benefit of masters and workmen.

The improvement of stage coaches and their multiplication kept pace with the mails. Turnpike roads also had been much improved by Mr M'Adam's system. He substituted on roads hitherto laid with gravel of all sizes, and round or carelessly broken stones of other qualities and materials, the improved surfaces of granite and other hard stones and flints, carefully broken into small angular pieces, which during the passage of heavy traffic dovetailed into one another, and made the surface firmer, whereas the round pebbles, under the old system, would slip from under the wheels and leave the surface of the road still uneven.

The factories for building stage coaches grew to be of large size and importance. Coach proprietors were

often very successful, and their business increased until Mr Chaplin had two hotels, five yards, and 1300 horses at work. Messrs Horne and Sherman had 700 horses each; and Mr Nelson, of the "Bull Inn," Aldgate, rivalled these. Stage coaches, as they carried more luggage and more outside passengers, were necessarily built stronger and rather heavier than the mail coaches. The cross roads, however, became gradually filled up with old mails re-painted, and stage coaches were also built upon elliptical springs in front, and generally three springs behind.

Gentlemen took to driving coaches for amusement, and vehicles were built with high coach boxes and high hind servants' seat; of different forms, it is true, and upon different sorts of springs. Two coaching clubs were formed of noblemen and gentlemen, who took an interest in four-in-hand driving and in vehicles in general. Several clubs of this kind are now flourishing, to encourage a manly sport, and with the capacity to promote improvements in the build and form of the "drag," as it is now called.

In Ireland, Mr Bianconi established a good system of travelling upon long four-wheeled cars of a light construction. The passengers sat back to back, and the luggage was piled between, and frequently so high that the traveller had only the opportunity of seeing one side of the road along which he passed. These vehicles would give more satisfaction now-a-days if better horses were used, and for shorter stages, on those routes where passengers are plentiful, but prefer to travel at more than five miles per hour.

In Switzerland and some parts of the continent, the use of large diligences still continues. Some of the old shape [Plate 36] recently performed the journey from Geneva towards Chamounix. The shape of modern diligences varies very much, many are like omnibuses; but almost all are without a perch and upon elliptical springs. In Continental travel may also be seen large family travelling carriages, as well as very light one-horse vehicles for mountain roads, and the further eastwards the traveller proceeds, the rougher and more simple the vehicle. In Russia may be found very rough, cheap, fast waggons, as well as the "Tarantas," which is a very comfortable travelling carriage for the wealthy, and with its numerous boxes and appliances, its bed and store cupboards for food, is almost a small house upon wheels.

Thus, whilst in our history we have enumerated the various methods of travelling used by our forefathers, we may, in passing from England to Persia overland, still have personal experience of almost all of these methods. All travelling dependent upon the speed of a horse has been, on good roads, almost the same in all ages. It is only since the introduction of locomotion by steam on railroads that we have attained any great advance upon ancient times. The years during which rapid stage coach and post chaise travelling seemed such a remarkable advance to Englishmen, only lasted from about 1810 to 1840. Since then the triumph of steam has in many places paralysed the improvement of stage coaches and posting

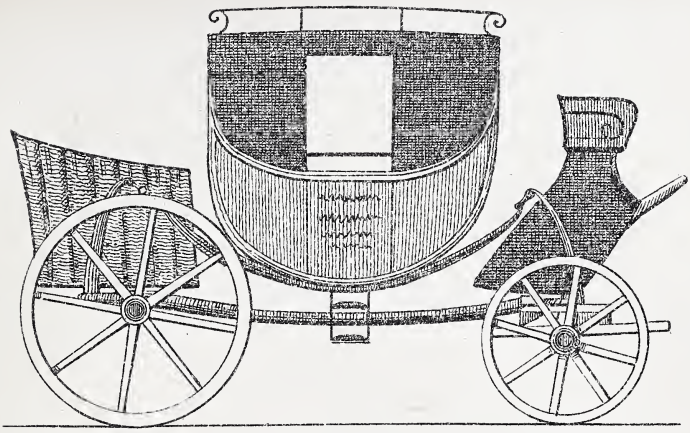


PLATE 34. AN ENGLISH STAGE COACH, 1787, AFTER ROWLANDSON

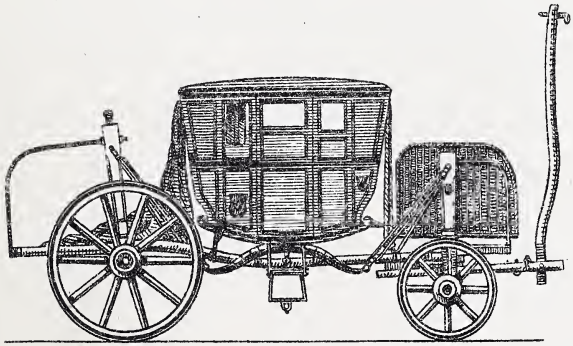


PLATE 35 DILIGENCE FROM PARIS TO LYONS.

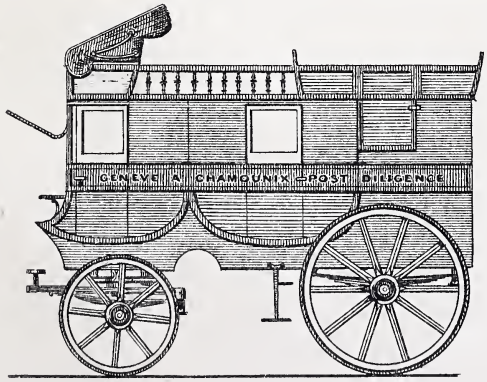


PLATE 36 MODERN FRENCH DILIGENCE.

upon ordinary roads, even where steam does not compete.

In France two-wheeled vehicles for public hire had been in use for some years previous to the commencement of the present century; but it was not until 1823 that London possessed a two-wheeled cab. In that year Mr David Davies built twelve two-wheeled cabs. The body was a little like a hansom cab, but smaller; it had a head of which the hinder half was stiff and solid, the fore part would fold. This arrangement was probably an imitation of the gentleman's cabriolet, the hood of which was rarely put down altogether, as the groom had to hold on by it.* Outside the head on one side was a seat for the driver of the cab, and the whole was hung upon stiff shafts. They were, I think, painted yellow, and stood for hire in a yard in Portland Street, close to Oxford Street. At this time the stands in the streets were occupied by hackney coaches, which certainly were all old coaches of the gentry; many still bore the arms of the former owners, and the drivers wore great coats with a large number of capes, one over the other, to keep in warmth and keep off the rain. It was not long before the two-wheeled cab became popular, and came on the ranks with the coaches.

* From a Newspaper, April 23, 1823 :—"Cabriolets were, in honour of his Majesty's birthday, introduced to the public this morning. They are built to hold two persons inside besides the driver (who is partitioned off from his company), and are furnished with a book of fares for the use of the public, to prevent the possibility of imposition. These books will be found in a pocket hung inside the head of the cabriolet. The fares are one-third less than hackney coaches."

Mr Davies' cab was copied, but with little variation from his pattern, and the total number of cabs in 1830 was one hundred and sixty-five. After this came Mr Boulnois' patent one-horse cab with a door behind, like a slice of an omnibus, the two passengers sitting face to face, the driver sitting on the roof—this cab it was hoped would succeed, but the shafts were too short, and the passengers always felt uneasy in case the horse should kick, and the vehicle, otherwise light and useful, fell out of fashion.

Mr Boulnois' cab was followed by a larger sort invented by Mr Harvey, and at last, about 1836, came the brougham cab to hold two persons; this was rather smaller than that afterwards built for Lord Brougham, and of plainer outline, with straight fore pillar. From this we derive our present clarence cab on four wheels, which we may pronounce as the lightest of all four-wheeled close cabs, but it is certainly anything but satisfactory. It carries, it is true, a large quantity of luggage on the roof, besides six persons, and runs along faster than the cabs of most other cities, but it is abominably noisy, and very rough in motion, uneasy and uncomfortable. Whoever will produce an improved four-wheel cab will deserve the thanks of his countrymen. The first step to this, I consider, would be the authorisation by law of two classes of fares. Let the present cab remain at the present fare, but allow a first-class cab to charge a higher fare, and appoint a proper person or persons to inspect the cabs, and to license the first-class cabs to charge a higher fare. The second step would be to insist on the first-class

cabs having patent or mail axles, and covered glass frames to lessen the rattle, and to adopt a regulating spring, which would assist in carrying a heavy load. Regulating springs can easily be made; they are unsightly on a private carriage; but this would be no objection in a public conveyance. It might be in the form of a buffer in the centre of the elliptical spring, or a second elliptic within the first, but the ingenuity of our spring makers would soon surmount the difficulty if the proper authority insisted upon the attempt.

The Hansom patent safety cab is an immense improvement upon the old high two-wheeled cab. We owe the invention to a Mr Hansom, the architect of the Birmingham Town Hall. The safety consisted in the arrangement of the framework at the nearest part to the ground, so as to prevent an upset if the cab tilted up or down. It has since been improved by Mr Evans, of Liverpool; Mr Marston, of Birmingham; and others, until the recently built hansoms are really convenient, easy, and comfortable conveyances, and receive the patronage of many ladies in preference to the four-wheelers.

Cabs of other towns of England and foreign countries have all their peculiar features. Many English towns allow a higher charge per mile than in London. In Plymouth, Southampton, Birmingham, Edinburgh, and some other towns the cabs are light, easy, and quiet. In Bristol they were recently heavy and slow, large and clumsy. In Paris, the cabs are chiefly old broughams of the gentry, with poor, slow horses; but during a great part of the year the stands have abundance of light, open

victorias, some of which are satisfactory, being easy and clean. In Rome, nearly all the cabs are open victorias, with hoods and a leather apron, which is, however, but a poor protection in heavy rain; the drivers are generally civil and intelligent. In Naples the cabs are also victorias of a smaller size, and hung higher from the ground, with little horses generally of a very sorry description. Milan has very good cabs, and the best omnibuses I have ever ridden in, quite like our private omnibuses, and they are kept up in very good condition. The streets are paved at Milan very evenly, and have tracks or tramways for the wheels, of long blocks of granite, on a perfect level with the rest of the pavement. These were first laid down at the beginning of this century, and have probably contributed to the general excellence of the carriages built at Milan. This city was one of the first to make improved carriages, even before France and England.

In the year 1662 a remarkable attempt was made to furnish a method of transport which should be within the reach of all, a sort of Omnibus carriage. It was originated and managed by Blaise Pascal, the well-known author of the *Lettres Provinciales*. He was assisted by several noblemen, who obtained a patent from the king for the privilege. The design was to run public coaches, carrying six persons each, along certain streets in Paris, each coach keeping to its own route, for the sum of five sous each passenger for the whole journey.

This was commenced in March 1662 with seven coaches, the drivers in a blue uniform, with the king's

and city's arms embroidered upon it. The coaches bore golden *fleur de lys* on the panels. At first they were a great success, and the sister of Pascal wrote to a friend, "I heard the blessings that were called down on the authors of an institution so advantageous and useful to the public." This was a general opinion. Two more lines of route were chosen, and the number of coaches increased. They were called "the carriages of the five soldi." It was, however, found necessary to raise the fare to six soldi, and this, with the increasing number of hackney coaches, the prohibition of the use of the omnibus by soldiers, servants, or any one in livery, and probably the death of Pascal himself, at the early age of thirty-nine, brought the enterprise to a premature end after the coaches had run nearly two years.

Stage coaches at the beginning of this century were used in London to bring men of business into the city, and the fare was ordinarily two shillings from Paddington or Clapham; they were slow and unpunctual, being usually an hour over the five miles. The first Omnibuses were built at Paris in 1820, were drawn by three horses, and soon became much in vogue; they were never very fast, and still are slower than our omnibuses, not because they cannot be driven fast, for occasionally they keep up a good speed, but because our neighbours attach so much importance to the way-bill, and stop at certain stations to take up passengers, or exchange some for the branch lines, and tickets are given at these stations beforehand bearing numbers which entitle the bearers to be first served. These

regulations detain the omnibuses very much; the same remarks apply also to the tramways, on which the progress is still slower than by the omnibuses. There is at Paris an excellent service of omnibuses for the conveyance of passengers and luggage from the hotels to the railway stations. They hold eight inside, and are quick and easy. All over the Continent the hotels have the best omnibuses; some of them are of large size, well stuffed, and lighted at night with good lamps. Sometimes each hotel has its own 'bus; sometimes one will serve several hotels.

The first Omnibus was started in London in July 1829, by the enterprising Mr Shillibeer, who had been for a short time a coachmaker at Paris. His first omnibuses were drawn by three horses, and carried twenty-two passengers, all inside. They ran in a shorter time to the city than the old stages; the fare was a shilling from the "Yorkshire Stingo," near the bottom of Lisson Grove, to the Bank.

We can imagine how unwieldy these carriages appeared even compared with the stage coaches and hackney coaches of the day, yet they soon proved a success; they followed the horses so easily that the drivers were astonished. The passengers were pleased by the speed, and the scheme should have been very profitable to Mr Shillibeer. The first omnibuses were thought too large for the streets of London, and they were superseded by a smaller pair-horse omnibus, carrying twelve passengers inside, and an extra one or two at the end of the omnibus, by the driver, but it was a very unpopular position.

In 1849, an outside seat was added along the centre of the roof, and by 1857 the omnibus had been improved nearly to what we now have, and this was chiefly done by Mr Miller, of Hammersmith.

Our present omnibus is probably the lightest and strongest vehicle in the world for carrying twenty-eight persons, at a speed of nearly eight miles an hour. If tried with four horses on a country road they easily beat the old-fashioned stage coach, either in weight, capacity for carrying, durability, or safety.

Large omnibuses are in use in Glasgow and Manchester, and other towns where speed is not so much an object as it is in London, and they have been re-introduced in London between Charing Cross and Portland Road, and there are a few small one-horse omnibuses for short distances. It is not necessary to describe these vehicles at any length; it is sufficient to notice that they must be light and strong for the work they have to perform, and the peculiar shape enables the builder to secure this.

The London General Omnibus Company has contributed greatly to the improvement of the system of public conveyance. It was founded in 1856, when it took over five hundred and eighty omnibuses previously in use, and belonging to a large number of different owners. The company had 6,400 horses the first year. Although many of their omnibuses have been superseded by the metropolitan and district railways, and the establishment of tramway cars, they have still 560 omnibuses and 6000 horses to work them. Each omnibus runs about sixty miles a day.

The company builds for its own use about thirty 'busses each year; the average weight of an omnibus is 24 cwt. Most of the vehicles are now provided with brake retarders, which are set in action by the foot of the driver, and check the speed down hill, or help to stop the omnibus to take up a passenger without so much strain upon the horses as formerly.

In Vienna the public omnibuses are longer, and are divided into two compartments, entered by separate doors; they carry twelve inside and six outside. The speed is rather slow and the appearance of most very shabby. In summer other omnibuses are also used, which are constructed without sides or windows, and in hot weather are agreeable from the free admission of air without draught.

American stage coaches began in 1786. As early as 1697 an innkeeper, named John Clapp, at the Bowery, New York, kept a hackney coach for the accommodation of the public; and in 1699 a law was made forbidding fast driving of "slees" through the streets of New York. The first private coach owned there appears to have been in 1745 by a Lady Murray. In 1786 there were but three Coachmakers' factories in New York: Mr Steel, in Pine Street, Mr Jones, and James and Charles Warner, in Broadway.

In 1789 six more factories had been opened in the coach trade, and five livery yards had begun to keep hackney coaches. In 1790 a coach was built in Philadelphia for eight hundred dollars, and there were eight Coachbuilders in that city. But the usual vehicle was a sort of wheel chair upon wooden springs, and

from recent accounts it seems that gigs, hung upon long wooden springs, are still in use in the United States and Canada.

The *Historical Magazine* states that in 1805 the English chariot was copied in America, but that it was found cheaper to order these carriages from Europe, on account of the high price of material, and the excessive cost of wages. In 1810 there were twenty-eight factories occupied by Coachmakers in New York. In 1822 a New York Coachmaker, named Miln Parker, had begun to make a name by building "volantes" for the Cuban and Mexican markets. These volantes are gigs, with hoods, perched upon two very high wheels, much used by the ladies of Spanish America.

I should have mentioned that the cabs of Vienna are of a superior description, consisting of victorias, broughams, and landaus, as well built and finished as those used by private persons. Many of these cabs are drawn by two horses, and are driven at a rapid rate. It would be a great benefit to London if we could procure such conveyances at a shilling, or even more, per mile.

CHAPTER VI.

Writers on Carriages—Periodical Publications on Coaches—Tight Harnessing—Height of the Driver's Seat—Cover to the Driver's Seat—American Buggy—American Trotting Waggons—Labour-Saving Machines—Machines Save Time—American Magazines on Carriages—Principles of Draught—Disadvantages of Two-Wheeled Vehicles—Track of Wheels—Utility of High Wheels—Side Thrust and Vibration of Wheels—Pitch of Axles and Dish of Wheels—Springs—Elliptic Springs—Brake Retarders—India Rubber Brake Blocks—A Load Should Rest on the Highest Wheel—Danger to a Stage Coach in Low Front Wheels—Carriage Drawings of Full Size—Value of being a Good Draughtsman—Mr Gladstone on Design—Coachmakers Company's Library.

THERE are not many books upon the art of Coachbuilding. There is a small one in the French language by F. A. Garsault, in the year 1761, which contains designs of the first improvements of the century in carts and carriages.

There is also Monsieur Roubo's work entitled "The Carpenter's, Cabinetmaker's, and Coachmaker's Art," published by the French Academy of Arts and Sciences, very carefully written, with numerous illustrations; it is certainly a perfect history of the art of Coachbuilding as it existed in the middle of the eighteenth century.

Nearly equal to that work is the article on carriages in the French Encyclopædia of 1770, by Diderot; both deserve study and examination by modern Coachbuilders. Mr Felton's work of the year 1790 I have already mentioned; also that on ancient Greek and Roman carriages by Herr von Johann Christian Ginzrot, of Munich. This is charming for an antiqua-

rian, but contains no information useful to a Coachbuilder of to-day.

Dr Richard Lovell Edgeworth published in 1817 a work upon "Public Road and Wheel Carriages," which contains much that is valuable and useful to Coachbuilders, and it should be studied carefully by every student in our art. There is in it an account of the experiments he made for the Government of Great Britain at Dublin, to ascertain the necessary height of wheels, length of a carriage, and other important rules of Coachbuilding.

Mr T. H. Markland read an interesting paper on the origin of carriages to a learned society, which is published in the twentieth volume of the "Archæologia," accompanied with several interesting copies of old pictures of carriages.

In the "History of Inventions," by Beckmann, is an interesting article on coaches, which has been taken as the best authority by all succeeding writers. The dates he gives are not all accurate.

The next published was, I believe, that by Mr W. Bridges Adams, in 1837, by Messrs C. Knight & Co., of Ludgate Street, entitled, "English Pleasure Carriages." This book should certainly be possessed by all Coachbuilders who desire information as to the best method of forming and completing a good carriage. It is full and accurate in the rules given, and the theories and mechanical principles expounded, giving very ample details as to materials to be used, and the manner of making the best use of them. Mr Adams, who was for a time in the firm of Hobson & Co., has given a description of the different carriages

used in his time, which will form a reference for future ages, as M. Roubo's descriptions serve for the previous century.

Since Mr Adams' work we have a valuable contribution to the history of the art of Coachbuilding in the treatise by the Count Giovanni Gozzadini on "The Origin of Coaches," published in 1864 at Bologna. This is in the Italian language; a copy is in the British Museum. We find in it a spirited defence of Italy from the charge of deriving their knowledge of Carriage-building from France; and the author proves, from the archives of different towns and noble families, that Italy was second only to Germany in its wealth and number of carriages during the sixteenth and seventeenth centuries. Besides these, we have had the *Carriage Builders' Art Journal*, which commenced in 1859 and lasted for four years, a journal which reflected great credit upon its editor, and is full of information still worthy of our study; the *Art du Carrossier*, published at Paris; two American periodicals; and the *Saddlers and Coachbuilders' Gazette* in London.

The carriages of America are so different from our own, and from those of Europe, that they require special attention. It is possible that their style may influence in an important degree the carriages of future ages. We see in them primarily "lightness." That lightness in their larger carriages is carried to excess most Coachbuilders will agree. We are supported in this view by the fact that for some years these, such as landaus, broughams, and coaches, have been materially modified by European types. The Americans

have adopted some of the shapes of Europe, and the mode of constructing the under carriages, retaining their own methods of making the pole and splinters, or whipple trees, as giving greater freedom to the horses. I think this principle of allowing the horse greater scope for exertion is particularly worth the attention of Coachbuilders. The manner in which our horses are confined by tight heavy strapping and traces, by tight pole chains, by bearing reins, and the indiscriminate use of blinkers to the bridles has been much overdone in England. If a horse with a heavy load, driven fast over slippery roads should stumble, it is most difficult for him to recover himself—he falls, is sometimes pushed along by the impetus of the carriage, and is more or less injured in his limbs or nerves by the accident, whilst it is difficult for him to rise again until the harness is unstrapped, and the carriage is removed from above him. We also harness our horses too closely to their work in the two-wheeled carriages. We have thought only of the ease of turning and moving the whole vehicle in crowded or narrow ways, without observing the advantage of the long shafts over short shafts. If the shafts are considered as levers by which the horse supports and moves the weight behind him in a two-wheeled cart, it will be at once obvious that (although whilst those levers are parallel with the road) it does not so much signify whether they are long or short; yet the moment they point upwards, and especially when they point downwards, the difference between long and short levers is felt severely by the horse. We can all of us lift a weight or support a weight

more easily with a long lever than with a short one, and it is the same with a horse. Those who have travelled abroad must have noticed the great weights placed upon two-wheeled carts in France and Belgium, and the greater comparative distance at which the horse is placed from the wheels, and yet how little the horse is distressed. He manages his load more easily because he does not feel the weight so heavily upon his back. Many drivers in England seem to have observed this, and try to ease the horse and lessen his chance of stumbling by tipping the shafts up in front, but in this way the horse is made to feel a pressure on the under part of the body which is neither natural nor healthy. I think therefore that, in future years, the growth of public opinion will be in favour of longer shafts and poles. This will also tend to preserve good carriages from the damage they at present suffer from the heat of the horses, and the quantity of mud which is thrown by their heels upon the front of the vehicle. The reins will of course have to be longer, but this cannot be of much consequence; the driver of a brougham is further from the horse than the driver of a mail phaeton, but we do not consider that the brougham is more difficult to drive than the mail phaeton on that account.

Another fashion prevalent in this and in some other countries, may prove, in the opinion of the drivers of the future, to be a fallacy; I mean the supposed necessity for the driver to sit nearly upright, which necessitates a deep boot and a clumsy thick coachman's cushion. In America, Russia, and in parts of Germany the driver

sits low, but places his feet against a bar in front of the footboard, which in their carriages is longer than in ours. I have seen four horses driven very well and easily in a low landau, and very powerful fast-trotting pulling horses held in with apparent ease. It has seemed to me that our coachmen are often in danger of being pulled over by their horses; and certainly, when an accident happens in a collision they are easily thrown from their boxes. They do not have the purchase and security that the Russian drivers especially seem to possess.

Perhaps we shall learn from the American carriages a few useful hints in this respect.

The American carriage, called, I believe, a "Rockaway," has a projection over the driver's seat, to shield him from sun and rain. Some of the Asiatic carriages have an awning for the same purpose. In Italy travelling carriages often had a hood over the driver. In instances where the master of the household likes to drive his own family carriage, it would certainly add to his comfort, and that of any one sitting by him, to have some useful addition of this nature.

The greatest novelty introduced by the Americans of the United States is the light waggon, called also "buggy," a name first given in England a hundred years ago to a light two-wheeled cart carrying one person only, and which we call a "sulky." These American waggons were modelled from the old German waggon, but they have been so much improved as to be scarcely recognised. The distinctive feature of the German waggon was a light shallow tray, sus-

pended above a slight perch carriage on two grasshopper springs, placed horizontally and parallel with and above the front and hind axle-tree; on the tray one or two seats were placed, the whole was light and inexpensive, and well adapted to a new rough country without good roads. These waggons may still be found in Germany and Switzerland. They were doubtless formed as a development of the V-shaped agricultural waggon already described in the second chapter.

American ingenuity was lavished upon these waggons, and they have arrived at a marvel of perfection in lightness. The two grasshopper springs have been replaced with two elliptical springs. The perch, axletrees, and carriage timber have been reduced to thin sticks. The four wheels are made so slender as to resemble a spider's web; in their construction of the wheels the principle of the patent rim used in England in 1790 has been adopted. Instead of five, six, or seven felloes to each wheel, there are only two, of oak or of hickory wood, bent to the shape by steam. The iron work of the American buggy is very slender, yet composed of many pieces, and, in order to reduce the cost, these pieces of iron are mostly cast, not forged, of a sort of iron less brittle than our cast iron. The bodies are of light work, like what we call cabinet work. The weight of the whole waggon is so small that one man can lift it upon its wheels again if accidentally upset, and two persons of ordinary strength can raise it easily from the ground. The four wheels are of nearly the same height, and the body is suspended centrally between them. There are no futchels;

the pole or shafts are attached to the front axletree bed, and the front of the pole is carried by the horses just as they carry the shafts; the splinter-bar and whipple-trees are attached to the pole on swivels. Some are made without hoods and some with hoods. These are made so that the leather of the sides can be taken off and rolled up, and the back leather removed, rolled, or fixed at the bottom, a few inches away from the back, the roof remaining as a sunshade. The leather work is very thin and of beautifully supple enamelled leather.

The perfection to which the American buggy or waggon has been carried, and every part likely to give way carefully strengthened, is marvellous. Those made by the best builders will last a long time without repair. The whole is so slender and elastic that it "gives"—to use a trade term—and recovers itself at any obstacle. The defect in English eyes of these carriages consists in the difficulty of getting in or out by reason of the height of the front wheel, and its proximity to the hind wheel—it is often necessary to partly lock round the wheel to allow of easy entrance. There is also a tremulous motion on a hard road which is not always agreeable. It is not surprising that, with the great advantages of extreme lightness, ease, and durability, and with lofty wheels, the American waggons travel with facility over very rough roads, and there is a great demand for them in our colonies. It must be remembered that the price is small, less than the price of our gigs and four-wheeled dog-carts. This cheapness

is attained by making large numbers to the same pattern, by using cast-iron clips and couplings, and stays, by the use of machinery in sawing and shaping, grooving and mortising the timbers, and by the educated dexterity of the American workman always ready to adopt any improvement. An educated man will make a nimble workman, just as an educated man learns his drill from the military instructor more quickly than a clown. An educated man finds out the value of machinery and desires to use and improve it. Instead of fearing its rivalry he welcomes it; he remembers that all tools, even the saw and the hammer, are machines, and that the hand, the human hand that guides those tools is but a perfect machine obeying the guidance of the brain more quickly and in a more varied manner than any man-made machine. The American workman therefore uses machines more and more.

In England machinery for wood-shaping is used at Derby, Newcastle, Nottingham, Worcester, and other towns; and in Paris some beautiful machinery is at work in coach factories. In London, I believe, it is chiefly confined to patent-wheel factories. We use also a few steam-driven saws, some paint-grinding mills worked by hand, and drilling and punching machines. But until the use of machinery is adopted more generally in London it is probable that the trade of building carriages for export will drift more and more to the provinces and to the Continent. The saving of machinery in omnibus and cab-building would be great, because the patterns vary so little,

and all other parts of one carriage could correspond with another, and counterchange when repairs were needed.

The Coachbuilders of the future will look to steam and hand machinery as their great assistant in cheapening the cost of first-rate carriages, in multiplying them for the probably increased demand, and in building carriages more speedily. It now takes from two to three months in building a brougham, of which at least five weeks are consumed simply in preparing the wood and iron work, a period which might easily be shortened by machinery.

With regard to the American waggons, they are so completely a carriage of themselves, there is so little to work upon, that we do not look for great beauty; that each of its parts should be gracefully shaped must be sufficient. The shape is conventional, affording no great opportunity for style.

The larger carriages of North America in which there is plenty of room for style and grace are, to an European eye, deficient in both. The extremely ugly straight and abrupt lines of the upper parts of the bodies, the wriggling, uncomfortable sweeps of the lower parts, the want of proportion, the scanty room for the legs of the passengers, must astonish all who have seen the carriages of other countries. American wheeled carriages seem to say, "We are made for lightness, and nothing else." On the sledges grace, comfort, and elegance seem to have been lavished, and, to use an American term, "pleasing lines" and sweeps abound in the sleigh.

In all carriages the proportions of the different parts, to please permanently, must harmonise. If at one time the fashion of the day is for deep quarters, deep rockers, and very shallow panels, it is certain that the eye of the man of taste will sooner or later correct this, and return to the proper depths of each. If at one time the wheels are too high, a Hobson will arise and cut them lower. If the curves grow too rampant, and the scrolls and foliage too abundant, a more cultivated taste will modify all this sooner or later. It is certain that our American cousins will alter the shapes of their larger carriages, and continue to improve them. In Australia—where the admiration for American and English carriages is nearly equal—there are native carriages built which, we are told, combine the lightness and durability of American vehicles with the grace and comfort of English carriages. It may not be so yet, but it is cheering, at any rate, to hear of the attempt, and all true lovers of the craft must rejoice if it succeeds.

In America the principles of draught have been carefully considered and discussed in a magazine specially published for Coachmakers, and which magazine does the greatest credit to its able editor, Mr Ezra N. Stratton, of New York ; it is beautifully illustrated, and is full of information for all branches of the craft. There is another magazine in the same city called the "Hub," edited by Mr George Houghton, who visited Europe to see the recent display of carriages at the Exhibitions at Vienna and London in 1873.

The principles of draught are in these works first set out with reference to the sledge. We are told that, from long experience, it is found if the traces are attached to the sledge so high that the trace is horizontal or parallel with the ground, and the sledge meets with any obstacle in a rough track, the runners will bite into the obstruction so as almost to stop the team, but if the traces are fastened lower, so as to form a straight line from the horse's collar to the hind end of the runners of the sledge, then they will lift, as it were, at the obstacle, and glide easily over it. This theory appears quite correct. It is more readily discovered in a sledge than in a carriage upon wheels, but the principle is the same in each. Again, if the runners project in advance of the sledge it follows easier than if they begin to turn upwards beneath the weight of the sledge. This in wheel carriages is the same as if the weight of the carriage were mostly on the low front wheel, instead of upon the higher hind wheels.

In the New York magazine we are asked, "Why will a team haul a load on a vehicle of four wheels easier than the same load upon two wheels?" and "Why will a team haul a load in a circle, which they cannot move straightforward?" The obvious answer is, that the same load presses on the ground in two places heavier than it does upon four places, and, secondly, that when moving in a circle the obstacles are less felt by the inner wheels than by the outer. But the magazine gives further ingenious reasons. When a load is resting upon a two-wheeled vehicle

it is very seldom placed so as to balance just right. If correct for level ground, as soon as it ascends a hill, or descends, the balance is unsettled. When the wheels come to a hole, or a big stone, all the load must be raised with two wheels and only half when on four wheels. Again, an uneven road twists the horse that is between the shafts from side to side, when the load is on two wheels, more than when, on four wheels, the fore-carriage rotates on the perch-box. Again, on an incline the four-wheeler moves by its own gravity, whilst the two-wheel gives additional weight at once on the horse's back. To the second question the magazine writer remarks that an experienced driver takes his load up hill zigzag, and not straight, and what is lost in time is gained in power. On the question of the height of the splinter-bar and whipple-trees, he gives his experience of twenty years that they should be, as a rule, a foot below the point of traction at the horse's collar. He explains the advantage of splinters (like our leading-bars) for all the horses of a team, and not only the leaders, to be this—that if one horse is lazy, then the others draw their bars forward, and, consequently, his bar going back brings his traces tight again.

With reference to the method of attaching the horses close to their work in England, and some distance from their work on the Continent, I wish to have it understood that I do not consider the Continental custom absolutely superior to the English custom, but I consider we might adopt a middle course with great advantage to the horses and passengers.

It is certain that on the Continent the horses have, in many instances, their traces too long, as it is that we have them often too short.

There has been much controversy about the difference in the length of the front and hind axle-trees. It has been usual to make no greater difference than will allow the higher wheel to follow in the same track as the lower. In France it has been the practice, from the year 1846, to make the front axle-tree of broughams six inches shorter. The object has been to allow the front wheel to be placed nearer to the body. As the front wheel of a brougham must turn entirely in front of the body, the additional gain of three inches was very desirable. Some English Coachbuilders have followed the example of the French. There is a decided gain. The eye is pleased with the proportions. The horse is eased, and upon hard roads the difference of track is of no consequence. On the other hand, in country roads, the well-worn ruts make the running of the carriage uneasy, whilst in town the driver often forgets that the curbstones will strike his hind wheels sooner than the front wheels, and lastly more mud is thrown upon the panels. It is probable that the French style will not find favour.

In coaches built in 1750 it was customary to lower the hind part of the inside seats about two inches, by degrees this was changed to a level seat; recently the seat has been again lowered behind, and the back squabs made more upright than formerly. The height of the top of the cushion to the bottom of the

body has varied during the same period from fourteen to eighteen inches. These slight changes belong more to the taste of the individual who uses the carriage. It is useless to lay down any general rule on these subjects.

If carriages had always to move along perfectly smooth roads, such as a tramway of wood, iron, or stone, the use of wheels in overcoming friction would be their sole utility, and the height of the wheels would be of small consequence. But as carriages are drawn along roads with loose stones and uneven surfaces, wheels are further useful in mounting over these obstacles, and it is plain that a high wheel does this more easily than a low one. To demonstrate this, let us suppose a shallow ditch or gulley of a foot wide and two inches deep, a wheel two feet high would sink into this and touch the bottom, but a wheel three feet high would only sink an inch, and a wheel four feet six inches high would sink only half an inch, on account of their greater diameters. Consequently, whilst the large wheel would have to be lifted by force of pulling only half an inch, the smallest wheel must be lifted two inches, and with the wheel must also be lifted a portion of the load of the entire carriage. Again, the long spoke acts as a longer lever, the point of draught being the axle, which is higher from the ground in the higher wheel, and again assists in overcoming the obstacle, as the angle of incidence is so much less.

To learn that the leverage power of a high wheel is very great we need only consider the advantages

gained by a large wheel in locomotives and in bicycles. In practice we find that wheels from 4 feet to 5 feet are sufficient for large carriages, and from 3 feet upwards for ordinary vehicles.

The present method of constructing all wheels which have to carry considerable weight will doubtless continue to prevail. The timbers of which they are composed, viz., elm for the stocks, ash and hickory for the rims, and oak or acacia for the spokes in Europe and America, have been found the best for many years. Wheels of the present make must also be dished. The tendency of a wheel is always to become upright, and when it becomes so by the gradual hammering out of the tyre to a greater length, and the gradual sinking of the spokes further into the nave and rim by wear and tear, then the wheel goes to pieces. If any one will watch the manner in which the materials of a mop become straight as it is twirled round, he will understand that the same centrifugal force compels wheels to become upright. Secondly, as a wheel runs along a road it is forced from side to side by the uneven surface, the uneven draught of the horses, and the rapid motion, which latter frequently causes the wheel to jump over the road instead of pressing equally over all its circumference. Then we dish our wheels, not only to keep the tyre tight as long as possible, but also to resist the lateral thrust, which in a perfectly upright wheel would soon force the spokes out of the naves. There is one exception to this rule in the American spider wheel; in this the spokes are not larger than a man's finger,

and being of elastic wood, bend like a reed under the lateral thrust, and recovering themselves again will endure, whilst the unbending oaken spoke would be unrooted.

The late Lord Palmerston, whose vigorous common sense grappled many a problem which would be supposed quite out of his line, was fond of talking about carriages. He considered that wheels should have the spokes dished, but that the arm of an axle-tree should be nearly straight, so that the outside rim of the wheel should be upright; and would illustrate the soundness of his views by quoting the wheels of artillery waggons and pony phaetons. It became necessary to remind his Lordship that we pitch the arms of the axles for two reasons; first, in order to keep the box of the axle pressing against the strong shoulder instead of against the weak linch-pin; and secondly, because the wheels, when they are wider at the top of the tyres than at the bottom on the road, will throw the mud away from, instead of into the carriage, or on the panels.

There is no absolute rule for the dish of the wheel or the pitch of the arm of an axle. Experience and custom point out to a builder what is best for different carriages and different countries. It is sufficient to say that a spoke two feet in length will last longest when not dished more than its own width in its length, and that the pitch of the axle arms, to ensure chiefly the duration of the wheels, should not be more than will leave the spokes pointing towards the ground, not upright, but narrower at the naves than at the rims by

three-quarters of an inch when the spokes are two feet long. This rule is simply for the duration of the wheel as long as possible, without reference to any other consideration, which the Coachbuilder, however, may find overrule what I have said.

If the axles of a carriage are rather stronger than is necessary—having regard to their length between the shoulders, and the weight they have to carry—it will be found to have a considerable influence upon the carriage, which will follow more steadily and quietly for the additional strength.

I do not propose to enter in this series of lectures at any length upon the subject of Springs. I think we are far from having attained perfection either in the manufacture or shape of springs for carriages.

It may have been remarked that the first springs were all elbow springs, placed in different positions, for different carriages. A double elbow or horizontal spring of a length of four feet seems to give the most easy play of any shape, and if made nearly straight at first wears little in the course of time compared with the elliptical shape.

In perch carriages we have abandoned the nearly upright spring for the C spring, chiefly because the C spring is of a more elegant shape, and also resists wear better than the elbow or whip spring, which was found to break away from its supports.

In elliptical springs the action of the steel plates is precisely contrary to the action in the C spring; in both the back plates are similar in shape, but the shorter plates in the C spring are on the inner side of the

curve, and in the elliptical they are on the outer side of the curve. A careful consideration of the effects of this variation may lead to a new combination which will be more satisfactory in its results. The elliptical springs made by Hobson were doubly compassed, and the same shape may be seen on some of the public omnibuses. A carriage may be hung to be very easy by using double horizontal springs, one under the other. At the Exhibition at Brussels this year (1876) the most easy hand ambulances on wheels were constructed in this manner.

In one elliptical spring you do not have the advantage of two horizontal springs, because the ends are in the elliptical spring united, and if a coupling is substituted at the hind end it is found in practice difficult to keep it upright.

Mr Adams, in his work on "Pleasure Carriages," considers it a mistake to hollow out each steel plate of a spring. I am quite of his opinion that this process of hammering leaves the inner surface of a steel plate very uneven, thereby harbouring moisture and dirt, and rendering the plate liable to fracture. I should recommend, on the contrary, that each plate should be ground or filed quite smooth on both sides. If careful tempering were generally the rule among Coach-builders, I am convinced that there would be fewer broken springs, and less complaint of rust accumulating between the plates.

The use of brake Retarders to the hind wheels has now for some years superseded the use of drag-shoes. It is evident that the action upon two wheels is better

than on one only; the brake can be applied or removed without stopping the carriage, which had to be done with the dragshoe; it can be relaxed in its hold in an undulating country, and the horses can proceed at speed up the next hill without the check formerly necessary whilst the drag-shoe was removed.

The brake was invented very early, and was in use in the coal trucks upon the first tramways in Northumberland, long before steam was used to draw them. They are now of two sorts: screw brakes, which are used on railways in England and all sorts of carriages on the Continent, and the old lever brake, which was the original form, and which is still the favourite among English coachmen. In Scotland the lever handle is often superseded by the treadle, or foot-brake, which has been selected by the General Omnibus Company.

In deciding upon the exact size and shape of the details of the brake a Coachbuilder is necessarily guided by the shape of the vehicle to which it is to be applied. It is necessary to attend to the following points: the lever arm that presses upon the rim of the wheel should be short, both for quick action and also for strength. The handle should be long, that the coachman may have greater power in applying the brake. The whole of the handle and the connecting-rod irons should be made somewhat weak to allow a little spring in them. If they are made too strong they will be rigid, and not fit with and favour the motion of the carriage and play of the springs. If a quick action is desired, the inner half of the levers on

the wheels should be short, or long if a slow action is preferred. The blocks which press upon the wheels have been variously made of cast-iron, wrought iron, brass, wood, india-rubber, and leather. The wood is the best for hold on the iron tyre and freedom from noise and smell, but it wears out fast. India-rubber, especially for light carriages, seems most satisfactory.

The use of the brake is very much overdone on the Continent, especially in Germany,—it is put on for such slight declines that the unfortunate horses are always kept up to their collars, and never get the ease that we give them going down hill.

There is an error which is deeply rooted among Coachbuilders and the public who use carriages, which consists in the idea that the draught is diminished by placing the front part of the under-carriage as far back as possible. Intelligent men who have thought on the subject, and watched the actual working of this idea, have long been convinced of the error, but much remains to be done to convince everyone of its fallacy. We have already seen that with large wheels the draught is less. If a load has to be placed on a four-wheeled vehicle it should be placed in relation to the front and hind wheels, so as to place the heavier part of the weight upon the higher wheels. To obtain this result it is sufficient to bring the hind carriage part as far under the body as it will work with comfort and safety, in order that as little weight as possible shall rest on the fore carriage part. English Coach-makers have been working at this for thirty years, but for the most part blindly. They have copied well-known

builders in construction as well as shape; they hear that these well-known firms' carriages run and follow very lightly, and if they would copy accurately they would obtain the same reputation. One firm should be specially mentioned as having for years been careful to build carriages to run lightly. As long ago as 1846 Messrs Laurie and Marner brought the hind wheel of their carriages well forward, and advanced the position and raised the height of the fore wheel, thus balancing the weight properly, or rather as properly as the shape of the landau and barouche will allow.

There are many carriages, however, such as stanhope and mail phaetons, omnibuses, waggonettes, and pony phaetons, in which it is easy to advance the hind wheel, so as to carry the principal part of the whole weight of the body. This has been done, but then many persons have erroneously imagined that the carriage followed the horse easily, not because the weight was on the higher wheel, but because the wheels were so near together, and they have pressed the Coachbuilder to keep the front wheels backwarder, instead of rather placing them forwarder, as they should have done. In the stage coach we see a conspicuous example of this great error, and some of the drags more recently built are the worst. If the roads round London were not so good as they are, or if the roofs of drags were loaded with luggage, we should hear of more accidents to the summer amateur coaches than we do at present. Most of the weight of the stage coach or drag is upon the front wheel, which is much the lowest, and it is so far back under the body that if

the horses gallop the coach begins to swing, and a very small obstruction is sufficient to upset the whole. Compare this with a similar load upon an omnibus, with four horses at a rapid pace on a bad road. The comparative security and safety of the latter vehicle is at once apparent. If a coach and omnibus could be fairly tried together, it would be found that the omnibus with three horses could beat the coach with four horses, besides doing its work with much greater safety, and turning in a much narrower road. It is right to mention that the idea, or a great part of the above, has been contributed by a foreign Coachbuilder, in whose views I entirely concur. It is as easy to make a stage coach as safe and nearly as light in running as an omnibus, by making it with much higher front wheels, and carrying them more forward. If it is considered essential to be able to turn in a narrow road, it would be easy to cut a small arch in the boot, which would allow the wheel to turn as far as the perch, instead of only half way to the perch as at present.

The reason given why drag-coaches are made with the front wheel so far back is, that it was necessary in order to bring the horses close to their work, to use a phrase that has been much misapplied, and also to bring them under the driver's hands, who prefers the reins short, but it would be quite possible to build a coach in which the driver might be over the horses, and yet have the advantage of higher front wheels, and properly placed for carrying the load.

The Coachmaker may often gather a useful hint by studying the construction of carts, which have to carry

heavier loads than carriages, often at an equal speed, and certainly not with better horses.

If the wheels of a vehicle are of equal height, the load should rest in the middle of the wheels. When the front wheels meet with an obstacle in the road the horse will only have to lift half the weight of the load, the other half being on the hind wheels. When the hind wheels come to the same obstruction again only half the load will have to be lifted, the other half being on the front wheels. But, as in English carriages, the wheels are very rarely of equal height, we should proportion the load more upon the higher wheels than upon the lower. As long ago as 1770 a Coachmaker, named Joseph Jacob, of St. Mary Axe, wrote thus:—"A load should always be placed in a waggon over the highest wheels, and as low as possible." This was the Mr Jacob who assisted at some experiments made at that time in the Strand, by direction of the Society of Arts, for the purpose of ascertaining the proper height of wheels. Mr Cuthbert Clarke was rewarded with a fifteen guinea gold medal. Mr Jacob had also received a twenty guinea medal for improved carriage springs.

During my lectures I exhibited some full-sized drawings of carriages made by M. Dupont, of Paris, to show how completely a Coachbuilder at a distance might be guided in building carriages by his designs. These drawings are quite works of art, and by means of them M. Dupont is educating the artistic taste of every manufactory which procures his aid. How much better our carriages would be if we worked from draw-

ings as carefully planned out and executed as these. Many of our artisans could, with a little instruction, draw quite as well, and by degrees would learn to draw with as much artistic taste and sense of the beautiful. Some artisans are now being instructed in the art of design, and I trust the day is not far distant when every workman will see that his son learns drawing as part of his education, and as the essential preliminary to any technical education which is to follow. The power of producing on paper the images figured on the brain is an important part and factor in all the arrangements of our social life, whether those images and imaginations, and reasons and problems, are traced with the pen in writing or with the pencil in a drawing, by both we record, we discipline, and we clear up more or less the busy thoughts that nature or surrounding circumstances have gifted and endowed us with. On the Continent, and especially in Paris, this has long been understood, and workmen have been carefully educated for this work. And, thanks to the department of Science and Art of South Kensington, thousands of students have past through the schools of design scattered all over England. If the artisans of the Coach Trade would follow the example of those engaged in the china and pottery trades, they would meet with the same success, and restore their fame for Coachbuilding to its former greatness.

Last year, in November, Mr Gladstone gave an address at Greenwich upon the study of science and art. I may be permitted to record here how in

that address he eloquently pressed upon his hearers that :—

"Beauty could and should be combined with economy and utility in all our industrial products; beauty was indeed a great element of utility; the trade of France was founded upon the beauty of that which it produces, and the economical application of means to ends; and that is due to the long culture and traditional application of the national mind to beauty in their products. The human nature in which we are cast was not endowed with all its marvellous faculties for nothing, and it is the due development of those faculties that constitutes the true and full idea of the duty of man in this world. It has been too much the habit in this country to regard beauty of production as something quite apart from usefulness of production, and at the same time to look upon the beauty which may result from human labour as a luxury reserved for the rich alone. But beauty has a commercial value, and its multiplication should form part of human education. We are all still at school, both young and old. We should then endeavour to work all things into beautiful forms, as did the ancient Greeks, so that artistic skill and love of the beautiful became an inheritance with them, formed part of their nature, accompanied their daily life, and entered into every kind of production. This is a time when all who are concerned in the welfare of the country feel it to be desirable that efforts should be made to give instruction, so as to improve the knowledge of the British artistic workman, and enable him to hold his position in the markets of the world. I confess," said Mr Gladstone, "I should like to see a great deal of this work done by the London Companies. That they should strive to make themselves illustrious in the country by fulfilling the purpose for which they were founded, namely, developing the crafts, trades, and mysteries of this great country (as the Society of Arts has laboured to do for so many long years) to promote beauty and economy in the production of works of industry. But I believe," Mr Gladstone continued, "that it is really in the individual that the secret of the whole matter lies. It is not as a body that you fill the benches of this room; you are here as individuals, and it is your thoughts and convictions, your own resolute efforts to improve, and energetically to direct your labours to the attainment of the highest end that constitutes the real resource to which we have to look. No auxiliaries can supplant, they can only aid individual exertion. Each

individual worker may have a notion of doing his work in the way which is most useful, but he ought also to have a sense of the difference between what is more useful and less useful, and what is more beautiful and the less beautiful. Now the sense of beauty is not, under natural circumstances, the favoured inheritance of a few only, it is meant to be, should be, and may be the universal inheritance of civilised mankind. It ought, therefore, to be the aim of the humblest artisan to acquire by study and thought such a sense of beauty as may elevate the character of the work he performs. And it will at the same time be found that as he developes beauty in his work he will raise his self-respect, he will raise himself, his family, and his class infinitely more than by any effort to get out of his position, either for himself or his children."

I trust I shall be excused for making this long extract from Mr Gladstone's speech, but it expresses so much and in such true and kindly language, that I felt I ought to add his well-considered words to my History of the Art of Coachbuilding.

The fine series of photographs of State and other Carriages, and the valuable library of the Coach and Coach-harness Makers Company are open every Saturday afternoon. Tickets of admission may be obtained at the principal Coachbuilders of London.

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